

Federal Lead Smelter - East Side
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Madison County
SF/HRS



CERCLA Site Investigation



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Section 1.0 Introduction

On March 28, 2018, the Illinois Environmental Protection Agency's (Illinois EPA) Office of Site Evaluation was tasked by the United States Environmental Protection Agency (U.S. EPA) Region V to conduct a Site Inspection (SI) at the Federal Lead Smelter (ASARCO)-East Side (ILN 000507845) site in Alton on Cut Street, Madison County, IL (38.87883/-90.14690).

The primary objective of a Site Inspection is to gather necessary information needed to evaluate the extent that a site presents a threat to human health and/or the environment. Waste and environmental media samples are collected to determine whether hazardous substances are present at the site and are migrating to the surrounding environment. At the conclusion of the SI, a determination is made as to whether the site qualifies for additional evaluation under Superfund or should be dropped from further Superfund consideration. Additionally, the SI supports removal and enforcement actions and collects data to support further Superfund or other response actions.

The SI is not intended to be a detailed evaluation of contamination or risk assessment. If the evaluation of the site indicates that the site qualifies for additional Superfund evaluation, an Expanded Site Inspection (ESI) may be conducted. Typically, the ESI addresses critical hypotheses or assumptions that were not completely supported during the SI. The SI is performed under the authority of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) commonly known as Superfund.

The Federal Lead Smelter (ASARCO) – East Side was placed on U.S. EPA's Superfund Enterprise Management System (SEMS) in 2014 in response to activities that had taken place on the property and the association with the adjacent property, Federal Lead Smelter (ASARCO). The Preliminary Assessment on Federal Lead Smelter (ASARCO)-East Side was completed on July 19, 2018. The most recent CERCLA investigation recommended that the

site have a Site Inspection completed to further delineate the extent of potential contamination present.

Section 2.0 Site Background

2.1 Site Description

The Federal Lead Smelter (ASARCO)-East Side site is an abandoned facility located in an industrial setting on 10 Cut Street in Alton, IL. It is located in Section 19, Township 5 North, Range 9 West of the Third Principal Meridian, Madison County. The Federal Lead Smelter (ASARCO)-East Side property consists of approximately 52 acres of commercial/industrial land containing multiple buildings, most of which are dilapidated and not structurally sound. A water tower is located next to a concrete-lined water basin on the west-central portion of the site. The buildings present on the west side of the site being investigated for this report were used during the lead smelting process of the Federal Lead Smelter operations, while the structure on the east side is from the aluminum smelting process (Figure 1). The former aluminum smelting building no longer has walls and appears to be completely stripped. The abandoned facility is in a heavy industrial area with other manufacturing businesses located nearby (Figure 1). There are no schools or daycare facilities located within a one-mile radius of the site. The nearest school is approximately 1.5 miles from the site facility.

The investigative property is bounded on the west by the former Federal Lead Smelter, on the north by Norfolk and Western rail line, south by wooded timber and Route 143 River Heritage Parkway. The Mississippi River is also approximately 2000 feet to the south. Chesson Lane and wooded timber border the site on the east. The Federal Lead Smelter (ASARCO)-East Side site was at one-time part of the Federal Lead Smelter (ASARCO) property (Figure 6 & 9). The Federal Lead Smelter (ASARCO) site (ILP000510792) was addressed under the Illinois

EPA Federal Site Remediation Section (Ramboll Environ 2016). Remedial activities completed at the Federal Lead Smelter (ASARCO) site included: excavation of the Lowland Area, clearing and excavation of the Upland Area, and consolidation of excavated material in an on-site Containment Area, which was subsequently capped and vegetated. The East Side portion of the Federal Lead Smelter (ASARCO) property was not addressed under the Voluntary Program since this portion of Federal Lead Smelter (ASARCO) had been sold to other buyers at an earlier date. The East Side portion of the Federal Lead Smelter (ASARCO) property is also referred to by many different names such as most recently MRC Holdings. Other names include Federal Lead Smelter-East Side, Federated Metals, U.S. Reduction, American Can Company, ASARCO, and Federal Metallurgy. For this report, Federal Lead Smelter (ASARCO)-East Side will be the name used to identify the property being investigated.

The geology of the site is unconsolidated materials consisting of finer-grain, alluvium deposits. The alluvial deposits are made up of recent floodplain deposits, recent alluvium, Wisconsin outwash, Illinoian near ice deposits, and glacial till (JMZ Geology). The alluvial deposits vary from 70 to 125 feet thick. Below this depth, consolidated bedrock is known to be Mississippian limestone made up of the Chester Series and Ste. Genevieve formation with minor shale and sandstone. Depth to bedrock varies from 93 to 135 feet on industrial sites directly adjacent to the site. No surface water is present onsite, and wetlands are located on the east and south of the site.

2.2 Site History

The Federal Lead Smelter (ASARCO)-East Side is an abandoned property which was at one time used as a primary lead smelting facility and was operated continuously by the Federal Lead Company from 1902-1912 and by ASARCO, Inc from 1912 to 1959 (Figure 6 & 9). Most

of the original and process equipment was dismantled or removed during 1961-1962. According to the Madison County tax assessor's office, the property was sold in 1969. The eastern portion of the Federal Lead Smelter (ASARCO) property is the focus of this investigation (Figure 1, 6, 9).

From approximately 1969 to 1974, the Federal Lead Smelter (ASARCO)-East Side property was an aluminum smelter that manufactured cans and was owned by the US Reduction Company. The aluminum smelter has been inactive since approximately 1974. In 1986, the site was sold to American Can Company which became Primerica. This company was then merged with Travelers in 1993 and in 1998 Travelers then merged with Citigroup. MRC Holdings is a subsidiary of Citigroup and is the present-day owner of the abandoned facility. Some structures remain on the abandoned property and are heavily dilapidated.

2.3 Previous Investigations

In February 2011 a complaint was made to the Illinois EPA Office of Emergency Response/Toxic Substance Control Act (TSCA) Unit concerning the Federal Lead Smelter (ASARCO) -East Side property about the presence of vintage transformers. In February 2011 the Illinois EPAs Collinsville Regional Office conducted a Citizens Complaint Inspection of the facility. The inspection consisted of a walk through and documentation of existing transformers. The citizen complaint pertained to the possibility of the transformers leaking.

A TSCA investigation was performed by Illinois EPA and conducted on April 12, 2011. The objective of the investigation was to document the facility's handling, storage, disposal practices, and compliance with PCB regulations. During the investigation transformers were found in a chain link fence and there was evidence that a cutting torch had been used to cut out one side of the unit and remove internal parts. Samples were collected from the transformers

and the adjacent soil on the ground. The samples confirmed the leaking of the transformers with the highest PCB reading of 140,000 parts per million (ppm). The owners of the abandoned property stated that they were not aware of the transformers and capacitors present onsite. Illinois EPA recommended that an environmental contractor be hired to clean up the PCB contamination.

Michael Baker Jr., Inc was hired by MRC Holdings, Inc. to complete work necessary to remediate the site of the PCB contamination present at the site. The site investigation and clean up was completed between March thru October of 2012. During this investigation, no other potential environmental concerns, other than the PCB contamination, associated with the site were investigated or remediated. The remediation of the site included the demolition of the Transformer Shell and pad, the switchgear building and equipment, and excavation of removal of PCB impacted soils. The remedial objectives for the PCB on-site was 25,000 ug/kg. Confirmation sampling was done on the excavation and demolition. Approximately 169 tons of PCB impacted soil and construction debris was removed and disposed of offsite (Baker 2013). This cleanup was done under the oversight of U.S. EPA and the authority of the Toxic Substance Control Act (TSCA).

In May 2017 Illinois EPA completed a Pre-CERCLIS Screening on the Federal Lead Smelter (ASARCO) – East Side property. During the investigation, information was gathered on the history of the property such as previous uses of the property and other investigations that had performed on the property (Illinois EPA 2017). A Preliminary Assessment was completed in July 2018. Screening XRF samples were collected and based upon results a Site Investigation was recommended for the site (Illinois EPA 2018). No offsite sampling has occurred during any of the previous investigations.

2.4 Regulatory Status

Based upon available file information the Federal Lead Smelter (ASARCO)-East Side does not appear to be subject to Resource Conservation and Recovery Act (RCRA) corrective action authorities. Information currently available does not indicate that the site is under the authority of the atomic Energy Act (AEA), Uranium Mine Tailings Action (UMTRCA), or the Federal Insecticide Fungicide or Rodenticide Act (FIFRA).

In 2011 MRC Holdings was notified by the Illinois EPA that they had received information concerning the possible presence of transformers containing Polychlorinated biphenyls (PCB) fluid. An inspection by Illinois EPA, under the Toxic Substances Control Act (TSCA), confirmed the presence of PCB containing transformers present near the Aluminum Smelter Building. Michael Baker Jr., Inc. was hired by MRC Holdings to investigate and remediate PCB releases at the former Aluminum Smelter Plant. During Michael Baker Jr., Inc's investigation in 2013 it was confirmed that PCB material at levels of 45,600 ug/kg was present on site. Based on the results from the site investigation activities and in consultation with MRC, it was decided to modify the site Remediation Objectives from High Occupancy cleanup standards to Low Occupancy default cleanup standards, which required the implementation of a deed restriction. These Remedial Objectives were created in accordance with the U.S. EPA Self Implemented On-Site Cleanup requirements. According to Madison County representatives from the Assessor's Office and Records Office, a deed restriction has not been implemented on the property as part of the TSCA PCB cleanup requirements. The cleanup included the demolition of the Transformer Shell and Pad, the Switchgear Building and equipment, and excavation and removal of PCB impacted soils. A total of approximately 169 tons of PCB impacted soil and construction debris was removed and disposed of offsite (Baker). No other activity or cleanup has occurred at the site since 2013.

Section 3.0 Field Inspection Activities

3.1 Sampling Activities

On October 1 - 3, 2018 Illinois EPA personnel from the Office of Site Evaluation (OSE) collected 14 soil samples (Tables 1 & 4) six sediment (Table 2 & 5), one surface water sample (Tables 6-10) and four Toxicity Characteristic Leachate Procedure (TCLP) samples (Table 3). The TCLP samples were collected to determine if hazardous material existed in the samples collected. One background soil and sediment sample were collected among the samples mentioned previously. All samples were analyzed for PCBs and inorganics. In addition to PCBs and inorganics, the surface water was analyzed for volatile organic compounds, semi-volatile organic compounds, and pesticides (shown in the Target Compound List (Attachment B). Photos of the site sample locations can be found in Appendix A. All samples collected during the investigation were analyzed by labs assigned through the U.S. EPA Contract Lab Program.

After sample collection, each sample was immediately placed into a cooler with blue ice for preservation. A global positioning system (GPS) was used to document the location of the sample collected and a field log book was used to take notes at each sample location.

3.1.1 Soil and Waste Samples

Soil samples were collected from various locations on the property (X101, X106 – X109, X111 – X113) and off the property (X102 – X105, X110 and X114). The matrix for these was characterized as “soil” for the purposes of laboratory analysis but material encountered and sampled on-site, as shown on Table 12 of this report, indicated that several samples were better characterized as waste samples. For the purposes of the report, samples X105, X110, and

X114 will be referred to as soil samples. Likewise, samples X101, X102, X103, X104, X106, X107, X108, X109, X111, X112, and X113 will be referred to as waste samples.¹

Sample locations were selected based upon past industrial activities that took place and results of field-based site characterization using X-ray fluorescence analysis (XRF). The XRF was used to document potential vertical migration within the top two feet (Table 11) and to determine the analytical sample location and depth during the investigation. The soil and waste sample locations can be found in Figure 2. All soil and waste samples collected from the site were collected from material associated with historical activities that took place on the site associated with the lead and aluminum smelter. Four samples were collected for TCLP analysis from the same sample location as samples X101, X108, X113 and X111 (Figure 2 & 10). One background soil sample, X114 was collected off-site at the Clara Barton School located approximately 1.7 miles to the north. All soil and waste samples were collected using a stainless-steel trowel and deposited into a clear 16 oz. jar. Tables 1, 3, and 4 contain the laboratory data for all soil and waste samples collected.

3.1.2 Sediment Samples

Five sediment samples were collected during the SI. Sediment samples X201-X205 were collected from potentially impacted drainage ways and ponds located on the south side of Federal Lead Smelter property and one background sample, X206, collected from the Alton Park. The drainageway located immediately south and below the waste pile was an intermittent stream that received runoff from the waste pile but did not have water flowing at the time of the sampling event. Sediment sample was collected from this drainageway. Sediment samples

¹ The characterization of these samples as waste is supported by their sample descriptions, laboratory analysis, and in most cases, historical and current aerial photography.

were collected using a stainless-steel auger and pan and deposited into a clear 16oz jar and then placed into a cooler with blue ice. All sediment samples were collected from 0-6 inches in depth. Sediment samples were analyzed for total metals and PCBs. Tables 2 and 5 contain the lab data associated with each sample and table 11 has a description of each sediment sample collected. Figure 4 and 4a illustrates the approximate location of each sediment sample.

3.1.3 Surface Water Sample

One surface water sample, S101, was collected from the surface impoundment located on site. The surface water impoundment was full of water and it was unknown what the surface impoundment was used for during the lead smelting process. The water was clear and had no odor. Additional volume was collected as S101 to allow for MS/MSD analysis. The sample was obtained by using a long pole with a cup attached to the end. The pole was dipped into the surface impoundment to fill up the cup and the sample was deposited into the appropriate jars. Sample S101 was analyzed for the Target Compound List (TCL) (Attachment B). Since the lead smelter had been closed for many years, it is presumed that the water in the surface impoundment is mostly rainwater.

3.2 Analytical Results

All the samples collected during the SI were sent to two labs within the U.S. EPA Contract Lab program. Chemtech Consulting Group located in Mountainside, NJ reported lab results for organic, pesticide, and PCB analysis for all media. Bonner Analytical located in Hattiesburg, MS reported lab results for inorganic and TCLP analysis for all media. Tables 1-10 contain all the analytical results for all data collected during the SI. An observed release or observed

contamination is documented if a hazardous substance in a release sample is present at three times the background concentration and is attributable to the site.

3.2.1 Soil and waste Sample Results

Tables 1, 3, and 4 contain the lab analysis for all soil and waste samples collected. Sample X114 is the background sample used to compare release samples and evaluate for observed release. No release samples were collected within 200 feet of a residence, daycare, or school. Thirteen release samples and one background sample were analyzed for total metals, mercury, cyanide and PCB. Figures 2 and 10 show the location of all soil/waste and TCLP locations on a map. All release samples except one, X110, contained at least one hazardous substance with concentrations identified greater than three times background. The main hazardous substance associated with all samples and that met observed release criteria was lead which ranged from 835 mg/kg to 73,300 mg/kg. Other hazardous substances that met observed contamination criteria for inorganics was zinc, 1440 mg/kg to 11,900 mg/kg; and chromium, 381 mg/kg to 629 mg/kg. The highest concentrations of inorganic constituents were predominantly within the waste material collected around the historical lead smelter operations.

Figure 3 illustrates the results of the TCLP samples collected from the site. Sample T101 failed TCLP analysis for lead and indicates that the waste associated with Federal Lead Smelter – East Side is characteristic hazardous waste.

There were also four samples, X102-X104, X113, that had observed contamination for PCBs. The readings for the PCB release samples varied from 150 ug/kg to 3900 ug/kg. A large portion of the samples that had elevated PCB were found around the waste pile located at the south end of the property. Samples X103 and X104, collected from the waste pile, had observed

contamination concentrations of PCB also. Figure 2 shows the soil samples collected during the SI.

3.2.2 Sediment Sample Results

Tables 2 and 5 contain the analytical results for sediment samples collected during the SI. Five release sediment samples and one background sample were sent to the laboratory for total metals, mercury, cyanide and PCB analysis. Sediment concentrations are compared to background concentrations and in most cases any contaminants present at three-times the background concentrations are considered attributable to the site and are referred to as "an observed release" (U.S. EPA, 1992). One sample was chosen as the background (X206) for comparison of all sediment samples collected during the SI. Sediment samples were collected from drainage ditches on the south side of the site, along with retention ponds and backwaters of the Mississippi River. According to past and present aerial photos, all of these water ways are connected.

In reference to the laboratory results for the sediments samples X201-X205, four samples contained one or more metals at concentrations greater than three-times background. Samples X201 and X205 contained the greatest number on constituents at concentrations greater than three-times background. Samples X201 and X205 each had eight and nine constituents respectively above three-times background. Sample X202 and X203 each had three and two constituents respectively greater than three-times background. The constituents most commonly found in each sample were cadmium and zinc.

The sediment samples nearest the waste pile had the highest concentrations of metals that were also found on the waste pile samples. Sediment sample X201 & X202 had observed release concentrations of cadmium and zinc. Sample X201 contained 5.2 mg/kg of cadmium and 403 mg/kg of zinc. Sample X202 contained 4.3 mg/kg of cadmium and 402 mg/kg of zinc.

Lead was detected at 3x background in two sediment samples: X201 (104 mg/kg) and X205 (195 mg/kg). Sample X201 was collected from the intermittent unnamed drainage ditch located at the foot of the waste pile. This drainage ditch was hydraulically connected to the retention pond and Mississippi River back waters. Figure 4 shows the sediment sample locations collected during the SI.

3.3 Additional Data

In addition to the samples collected, an X-Ray Fluorescence (XRF), which is used for the screening of inorganics in soil and sediment media, was used to screen all soil and sediment samples collected and assist in the location of sample collection (Table 11). Some notable readings acquired from the XRF included lead at 143,205 mg/kg and zinc at 16,624 mg/kg. The XRF data assisted in identifying hazardous substances located in potential sources and migration pathways impacted by the hazardous substances. This data was crucial in establishing analytical release sample locations.

Section 4.0 Site Sources

This section includes descriptions of the various hazardous waste sources that have been identified at the Federal Lead Smelter (ASARCO)-East Side site. The Hazardous Ranking System defines a "source" as: "Any area where a hazardous substance has been stored, disposed or placed, plus those soils that have become contaminated from migration of hazardous substance." This does not include surface water or sediments below surface water that has become contaminated.

Information obtained during the Site Inspection identified two separate areas of tailings piles as sources of contamination at the Federal Lead Smelter (ASARCO)-East Side site. As additional information becomes available, the possibility exists that additional sources on contamination may exist.

Section 4.1 South Slag Pile

Laboratory data associated with the SI appears to confirm waste associated with the aluminum smelting processes that occurred on the Federal Lead Smelter (ASARCO)-East Side property attributed to the slag pile south. Currently the pile is approximately 25 to 30 feet tall. According to aerial photos the waste pile is easily identified on the south side of the site. The pile is identified by its color (gray and white) and waste samples X103 and X104 were collected at the surface from the top of the pile. According to historical aerial photography it is clearly visible that waste material from the aluminum smelter was being deposited on the south side of the property. It is not known if this material was deposited in an approved disposal area or what part of the smelting process generated the waste. Bases upon visual observations, it is not presumed that it was an approved disposal area.

Laboratory and XRF data also helped delineate the waste from other samples collected around the area. The XRF readings for lead collected from the pile ranged from 169 ppm to 1714 ppm. In addition, zinc number associated with the tailings pile ranged from 2322 ppm to 16,624 ppm. Inorganic laboratory data collected on the tailings pile also correlated with the XRF readings for zinc. Waste sample X103 had 11,900 mg/kg (ppm) of zinc and X104 had 7,950 mg/kg. Lead ranged from 1060 mg/kg in X103 and 2180 mg/kg in X104. PCBs were also associated with the pile and ranged from 150 ug/kg to 1500 ug/kg.

Using aerial photography in ArcGIS, the South Waste Pile was calculated to have an area of approximately 188,846.919 sq./ft. Both samples collected from the pile were collected from the

surface. The depth of the tailings pile was not calculated during the SI. The topography of the waste pile slopes steeply to the east, west and south. Surface water drainage from the pile on the south side enters into the unnamed intermittent creek immediately below the pile.

4.2 North Waste Pile

The other identified source was the waste pile that is spread out over the northern portion of the property and is associated with the lead smelting process. The source is defined by waste samples X101, X106-X109 and X111-X113 (Figure 2). Laboratory data and XRF analysis confirms the waste associated with this source. According to the aerial photos included in Figure 9, it shows the foot print of the former lead smelter in the 1941 photo and the more recent photo without the lead smelter. The site is covered with waste and devoid of vegetation during site operations according to historical aerial photos (Figure 9).

Laboratory and XRF data associated with the source helps to define the waste associated with the source. XRF readings associated with this source ranged from 133 ppm to 143,205 ppm. In addition to the lead numbers, zinc XRF numbers ranged from 1083 ppm to 8292 ppm. The analytical data also correlated with the elevated XRF data, lead ranged from 3,170 mg/kg (ppm) to 73,300 mg/kg and zinc ranged from 1,440 mg/kg to 7,320 mg/kg. All concentrations met the criteria for observed contamination.

Using aerial photography and ArcGIS, the North Waste Pile had an area of approximately 318,207.629 sq./ft. based upon the connection of sample points collected from the tailing pile north source. Depth was not estimated for the northern waste pile. The material associated with this source was scattered on the ground. The topography of this source is flat. Surface water drainage for this pile is presumed to be absorbed vertically into the ground based upon topography and the lack of storm drains located on site.

Section 5.0 Migration Pathway Discussions

As identified in CERCLA's Hazard Ranking System, the Office of Site Evaluation evaluates three migration and one exposure pathway. Sites are evaluated on their known or potential impact these pathways have on human health and the environment. The following paragraphs will evaluate the groundwater, surface water, soil exposure, and air migration pathways.

5.1 Groundwater

No private or public drinking water samples were collected for this investigation. Drinking water for the City of Alton is supplied by the Illinois American Water Company Alton Division community water supply. The Mississippi River serves as the primary source for Alton's water supply. Alton draws surface water from the Mississippi River through two water intakes. The surface water intake is located approximately 4 miles upstream of the site (Figure 7) and is operated by Illinois American Water Company. The supply provides approximately 9 million gallons per day to a population of approximately 72,000 people in Madison, Jersey and Macoupin Counties. The Granite City surface water intake serves approximately 50,000 people and is in the 15-mile target distance limit and is approximately 10 miles downstream of Federal Lead Smelter (ASARCO)-East Side.

The HRS Guidance defines the Target Distance Limit (TDL) for the groundwater migration pathway as a 4-mile radius from sources at the site (U.S. EPA 1992). Figure 11 identifies the location of community, non-community, and private water supply wells located within the TDL. The information used to complete Figure 11 was obtained from an Illinois EPA database generated from Illinois State Geological Survey data. The private well locations on Figure 11 include private wells, engineering borings, and mining boring locations and may not accurately indicate the number of private wells located within the TDL. To the best of Illinois EPAs

knowledge and based upon ISGS databases, there are no ISGS wells used for drinking. All ISGS wells located south of the site are engineering wells operated by the Army Corp of Engineers. Groundwater flow is in a south western direction towards the Mississippi River located a half mile to the south.

There are no known targets impacted by the groundwater pathway at this time. The groundwater pathway is of little concern since potable drinking water is being supplied by the Illinois American Water Company, which uses the Mississippi River as its source. Populations located within each distance category are provided in the following table.

Population within 4 miles of the site

Distance in miles	Population *
0-1/4 miles	0
1/4-1/2 miles	0
1/2-1 miles	563
1-2 miles	10065
2-3 miles	13003
3-4 miles	10752

* ArcGIS was the source of population information.

5.2 Surface Water

The surface water pathway is defined by the HRS Guidance as the path that hazardous substances would travel over land from a source to surface water and within the surface water to the TDL. The surface water migration pathway is discussed in the following sections. The in-

water segment and overland flow of the surface water pathway is illustrated in Figure 6. The 15-mile in-water segment included the unnamed drainage channel, retention pond, and the backwaters of the Mississippi River make up the overland flow segment of the for the site. The surface water intakes are up river of the TDL in the Mississippi River, except for the Granite City intake located approximately 10-miles downstream. Alton's surface water intakes located on the Mississippi River are located outside of the TDL.

The surface water pathway is one of the likely pathways to be completed. According to the United States Geological Survey (USGS) topo maps for the Alton Quadrangle, the site is located approximately 430 feet above mean sea level. The property then slopes dramatically by approximately 30 feet to the south towards the Mississippi River. The vast majority of the property is flat except for the extreme southern portion. Aside from the concrete lined surface water impoundment, there are no surface water bodies located onsite. The surface water impoundment was sampled, and no major contaminants of concern were detected. There are surface water bodies located just south of the site at the bottom of the slope between the Mississippi River and the facility (Figure 8). These surface water bodies include the unnamed drainage ditch, the retention pond, and the Mississippi River backwaters.

According to flood insurance maps dated from 1982 the property is not included in a 100 or 500-year floodplain but in late December 2015, a 100-year flood occurred, and the area received over 9 inches of rain in a three-day period. This rainfall event prompted the United States Army Corp of Engineer to flood the lowland area just south of the property. The facility is protected from flooding by the Wood River Levee System just south of the site and along the Mississippi River. Also, directly south of the property is the Mel Price Dam that was completed in 1994.

The National Wetlands Inventory map indicated the presence of isolated wetlands located on the site as well as isolated wetlands located just south of the property between the Mississippi River and the facility (Figure 12). These wetlands are classified as Palustrine Emergent Persistent Temporary Flooded (PEMA) and made up of approximately 484,021 sq/ft. Surface water runoff from the property interacts with the wetlands at the bottom of the slope on the south side of the property (Figure 3). These isolated wetlands are approximately 797,248 sq./ft. or 5,975 feet in distance. The nearest surface water body that would be used as a fishery is the Mississippi River located approximately 2000 feet to the south of the property. The surface water pathway is the most likely impacted especially due to the XRF readings of high lead found on the property and the presence of wetlands.

Endangered and threatened species located in Madison County include Indiana bat (*Myotis sodalis*), Northern long ear bat (*Myotis septentrionalis*), Least tern (*Sterna antillarum*), Pallid sturgeon (*Scaphirhynchus albus*), Spectaclecase mussel (*Cumberlandia monodonta*), Decurrent false aster (*Boltonia decurrens*) and Eastern prairie fringed orchid (*Platanthera leucophaea*) (Fish and Wildlife Services 2017).

5.2.1 Unnamed Drainage Ditch and Retention Pond

An intermittent unnamed drainage ditch receives runoff from the South Slag Pile and the North Slag Pile. Observed contamination was identified on the South Slag Pile at sample X103 and X104 and the North Slag Pile (Figure 2) at X101, X106-X109, and X111-X113. The overland flow for the South Slag Pile (Figure 2) is located directly below the pile as the unnamed drainage ditch is located adjacent to the South Slag Pile (Figure 6). The overland flow for the North Slag Pile is defined by the slope in topography from the North Slag Pile to the retention pond and unnamed drainage ditch. The unnamed drainage ditch and retention pond are

connected to each other. According to aerial photography it appears that the retention pond did not exist until sometime after 1996. According to the National Fish and Wildlife Services Wetland Mapper program (Figure 3), the PPE lies within an HRS eligible isolated wetland defined as Palustrine Emergent wetland (Figure 3). Cadmium, lead, and zinc were detected at concentrations significantly above background in samples X201 and X202 located in the retention pond and the unnamed drainage ditch.

5.2.2 In-Water Segment

The 15-mile target distance limit is reached within the Mississippi River system south of the Melvin Price Lock and Dam located approximately 2500 feet south of Federal Lead Smelter-East Side. The in-water segment located in the Mississippi River is approximately 14.5 miles. There are wetlands located all along the 14.5 miles in the Mississippi River. At this stage of the investigation, the potential wetland frontage has not been calculated. Figure 4 and 6 illustrates the 15-mile target distance limit as well as the PPE for the site. The water flow into the Mississippi River is controlled by the Wood River Levee System located directly south of the site. When the water gets high in the backwaters it is pumped into the Mississippi River from the East Alton Pumping Station No. 1 (Wood River Levee Superintendent).

The Mississippi River is used as a fishery according to the Illinois Department of Natural Resources (IDNR, 1995). There was one surface water intake located in the 15-mile TDL according to information obtained through ArcGIS database. This surface water intake is supplied to Granite City by the Illinois American Water Company.

5.3 Soil Exposure

The facility is currently inactive and surrounded by a fence on the western and northern portion of the site. The fence does not surround the southern and eastern boundaries and is therefore accessible to the public. At the time of the investigation, there was a gated fence at the north entrance but there was no guard on duty. The facility is managed by a local caretaker that allowed Illinois EPA access to the site. The facility is situated in an industrial development of Alton and surrounded by many industrial businesses such as Alton Steel. There has been reports of homeless people residing on the property. The property consists of a few old buildings left over from the lead smelting processes that took place on the property. There are also the remnants of the old aluminum smelting building located on the east side of the property (Figure 1). There has been remediation of PCB containing transformers and contaminated soil that was in the aluminum smelting structure. The PCB containing transformers were vandalized by trespassers and subsequently cleaned up from a previous environmental clean-up. The soil exposure pathway is of potential concern due to the high lead readings (165,000 ppm) and the wetlands located to the south of the property. The population in the area is minimal, as shown in the following table, due to the location of the site being in an industrial development area. Although there was evidence of hunters in the area with the discovery of shotgun shells that was found throughout the property. The vapor intrusion pathway is not thought to be of concern at this time due to the lack of structured buildings being occupied and the lack of volatile compounds being of importance at this site. There are some state designated natural areas as part of the 15-mile target distance limit but no areas directly in contact with the site. A nesting bald eagle was encountered during the clean-up of the adjacent property, but the bald eagle is no longer listed as a federal endangered or threatened species.

Distance	Population
0-1/4	0
1/4-1/2	0
1/2-1	563

2010 Census data using ArcView

5.4 Air Pathway

There were no air samples taken at the site and therefore the air pathway is not thought to be of concern at this time since most buildings associated with the property have been demolished and activities have not taken place on the property in over 50 years.

Section 6.0 Summary

The Federal Lead Smelter (ASARCO)-East Side site is an abandoned facility located in an industrial setting on 10 Cut Street in Alton, IL. The Federal Lead Smelter (ASARCO)-East Side property consists of approximately 52 acres of commercial/industrial land containing multiple buildings which most are dilapidated and not structurally sound. There is a water tower located on-site next to a concrete lined water basin. The buildings present on the west side of the site being investigated for this report were used during the lead smelting process of the Federal Lead Smelter operations and the structure on the east side is from the aluminum smelting process (Figure 1). The abandoned facility is in a heavy industrial area with other manufacturing businesses located nearby (Figure 1). The Federal Lead Smelter (ASARCO)-East Side abandoned property was at one time used as a primary lead smelting facility and was operated continuously by the Federal Lead Company from 1902-1912 and by ASARCO, Inc

from 1912 to 1959 (Figure 6 & 9). Most of the original and process equipment was dismantled or removed during 1961-1962. The eastern portion of the Federal Lead Smelter (ASARCO) property is the focus of this investigation (Figure 1, 6, 9).

The purpose of this investigation was to assess possible hazardous waste contamination and its potential threat to human health and the environment associated with the Federal Lead Smelter's past operations on this property. This facility was chosen for a Site Inspection based upon information obtained during the Preliminary Assessment conducted in 2017. An additional concern is that this eastern portion of the Federal Lead Smelter site was not included in the original bankruptcy cleanup of the former ASARCO property which is located directly west, and therefore the East Site property was never addressed under the state Voluntary Program. Lead from soil and waste samples collected on-site ranged from 835 mg/kg to 73,300 mg/kg. Zinc concentrations ranged from 65.8 mg/kg to 11,900 mg/kg.

The surface water pathway was the pathway of most concern and was the primary focus of the SI. Two different slag piles were identified on site as potential sources of contamination. The South Slag Pile is the source closest to the probable point of entry into the surface water pathway. Lead was the main contaminant found at concentrations that were above observed release criteria. Contaminants from the South Slag Pile are being deposited into the unnamed intermittent drainage ditch and travels south towards the retention pond and the Mississippi River backwaters which then feeds into the Mississippi River by way of the Wood River Levee System.

The soil exposure pathway was evaluated as a part of the Site Inspection. However, the soil exposure pathway is less of a concern because there are no residents as defined by the HRS either on-site or within a mile.

The groundwater pathway is of little concern at this time due to potable drinking water for the area being supplied by the Illinois American Water Company, which uses the Mississippi River as the primary drinking water source.

Section 7.0 References

- Remediation Completion Report, Former Federated Metals Site, East Alton, IL, MRC Holdings, Inc, Michael Baker Jr. Inc.; April 2013
- Remedial Investigation Report, Federal Lead Smelter, Environ, July 2012.
- Pre CERCLA Screening, Illinois EPA, May 11, 2017.
- United State Environmental Protection Agency, Office of Solid Waste and Emergency Response, Hazard Ranking System Guidance Manual, Publication 9345.1-07, November 1992.
- Fishing the Middle Mississippi, Illinois Department of Natural Resources, June 1995.\
- Illinois County Federal Endangered and Threatened Species, U.S. Fish and Wildlife Service. May 9, 2017.
- Wood River Levee and Drainage Dist., Vincent Milazzo, Superintendent.
- Site Investigation, JMZ Geology, August 18, 1994.
- Preliminary Assessment, Illinois EPA, July 19, 2018.

FIGURES

Figure 1
Site Map

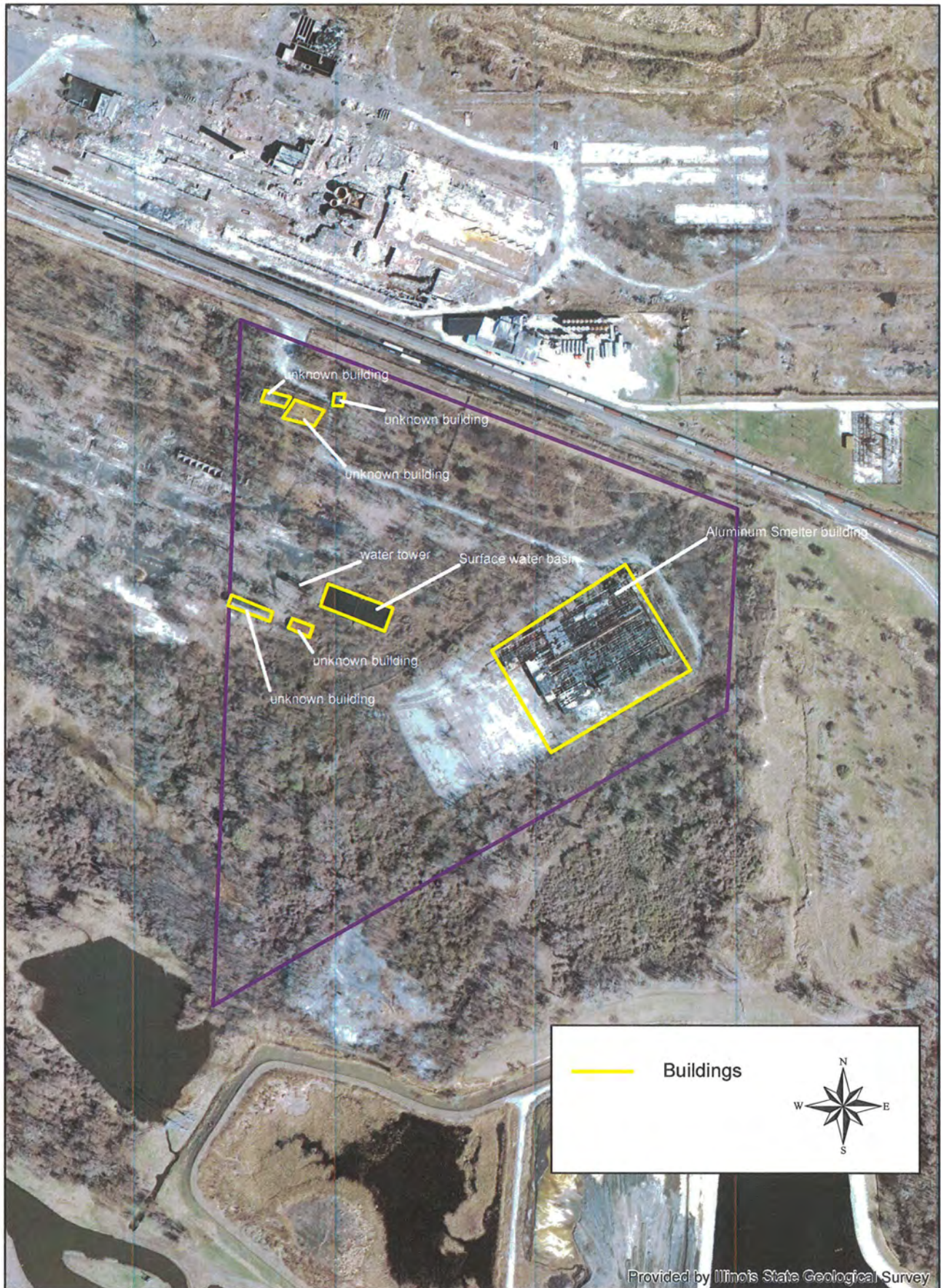


Figure2
Soil Sample Locations
Federal Lead Smelter-East Side



Figure 3
XRF Locations

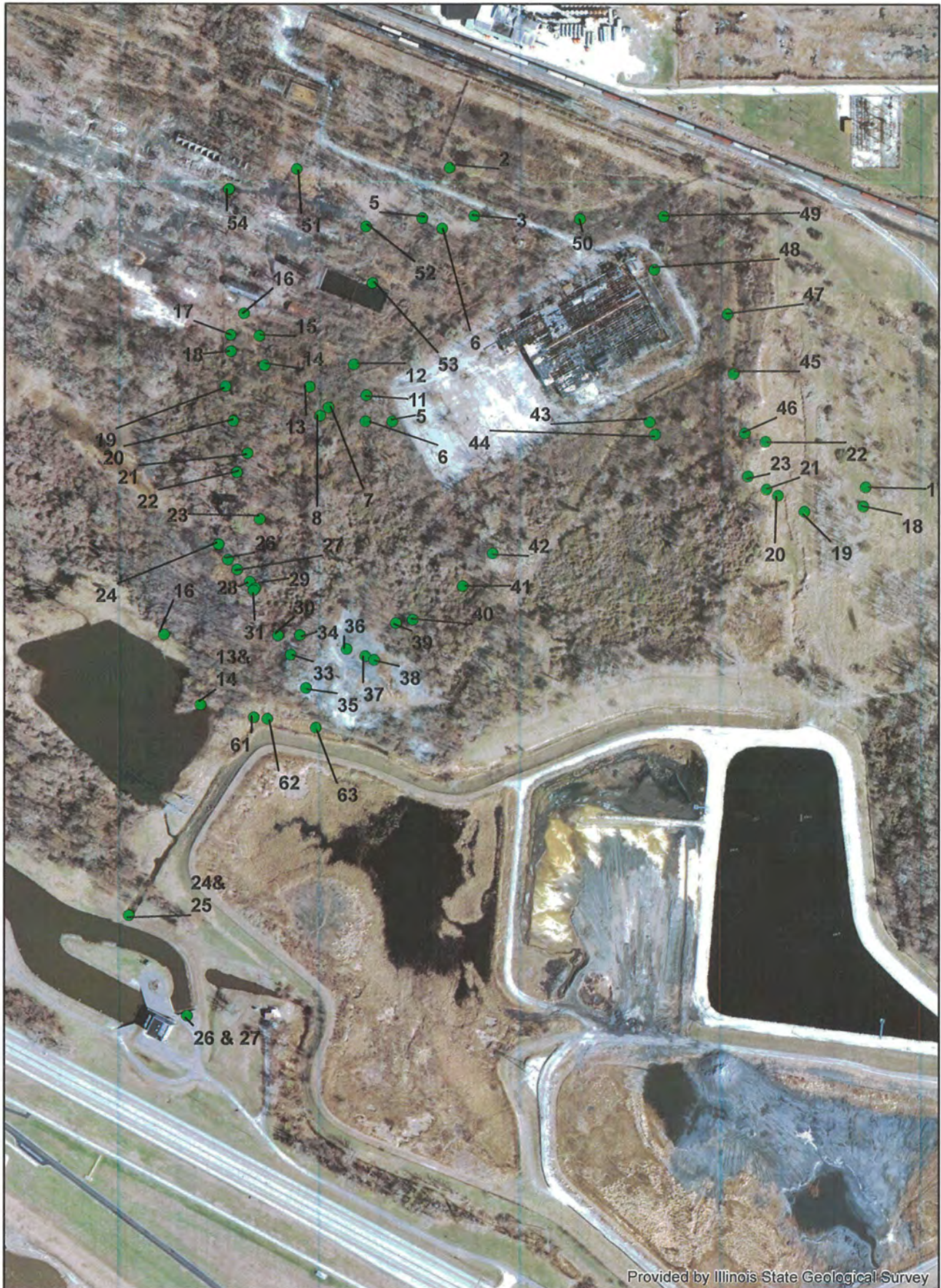


Figure 4
Sediment Sample Locations
Federal Lead Smelter-East Side



Figure 4a
Sediment Sample Locations
Federal Lead Smelter-East Side



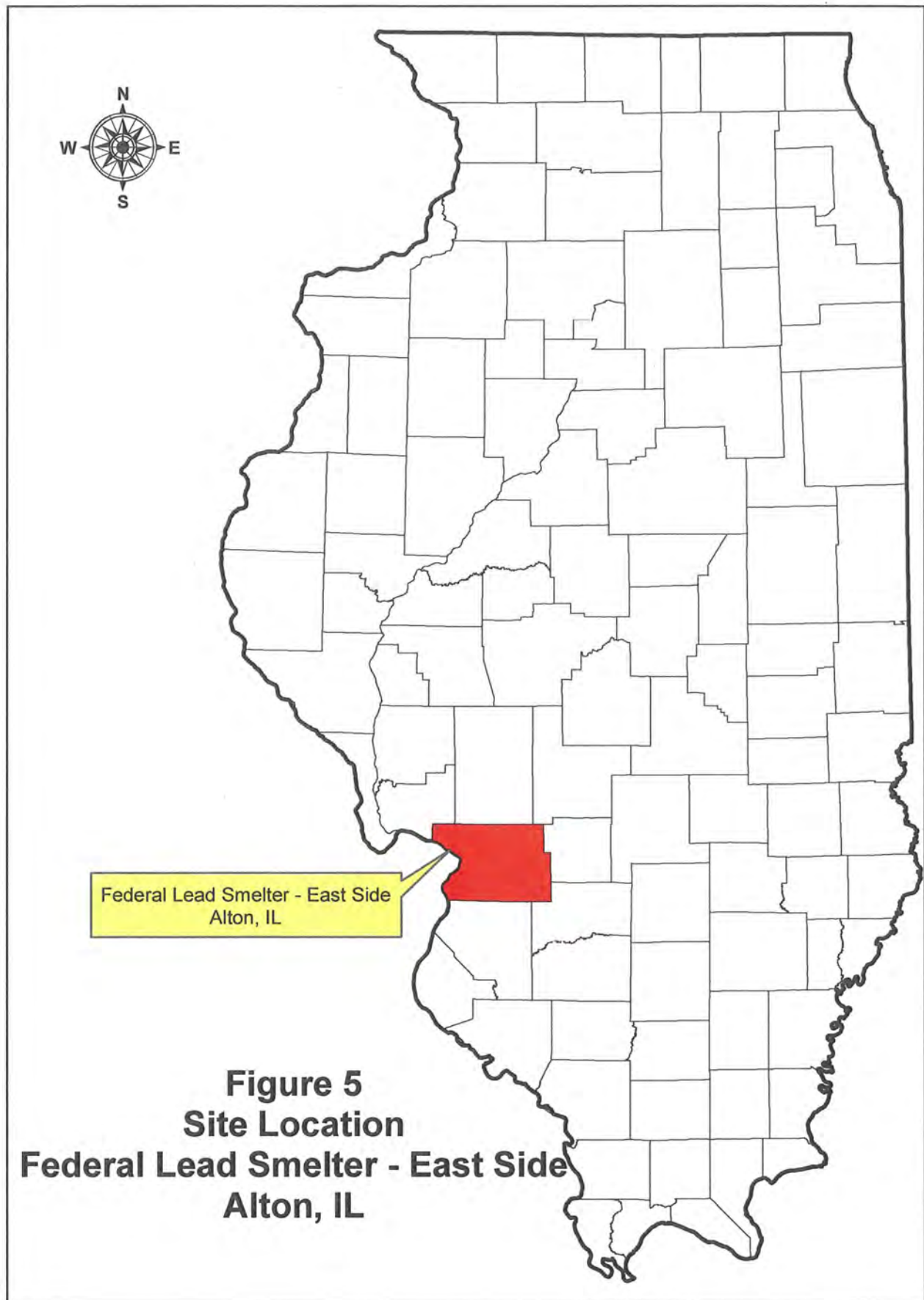


Figure 5
Site Location
Federal Lead Smelter - East Side
Alton, IL

Figure 6
15-Mile Target Distance Limit



Figure 7
Surface Water Intakes

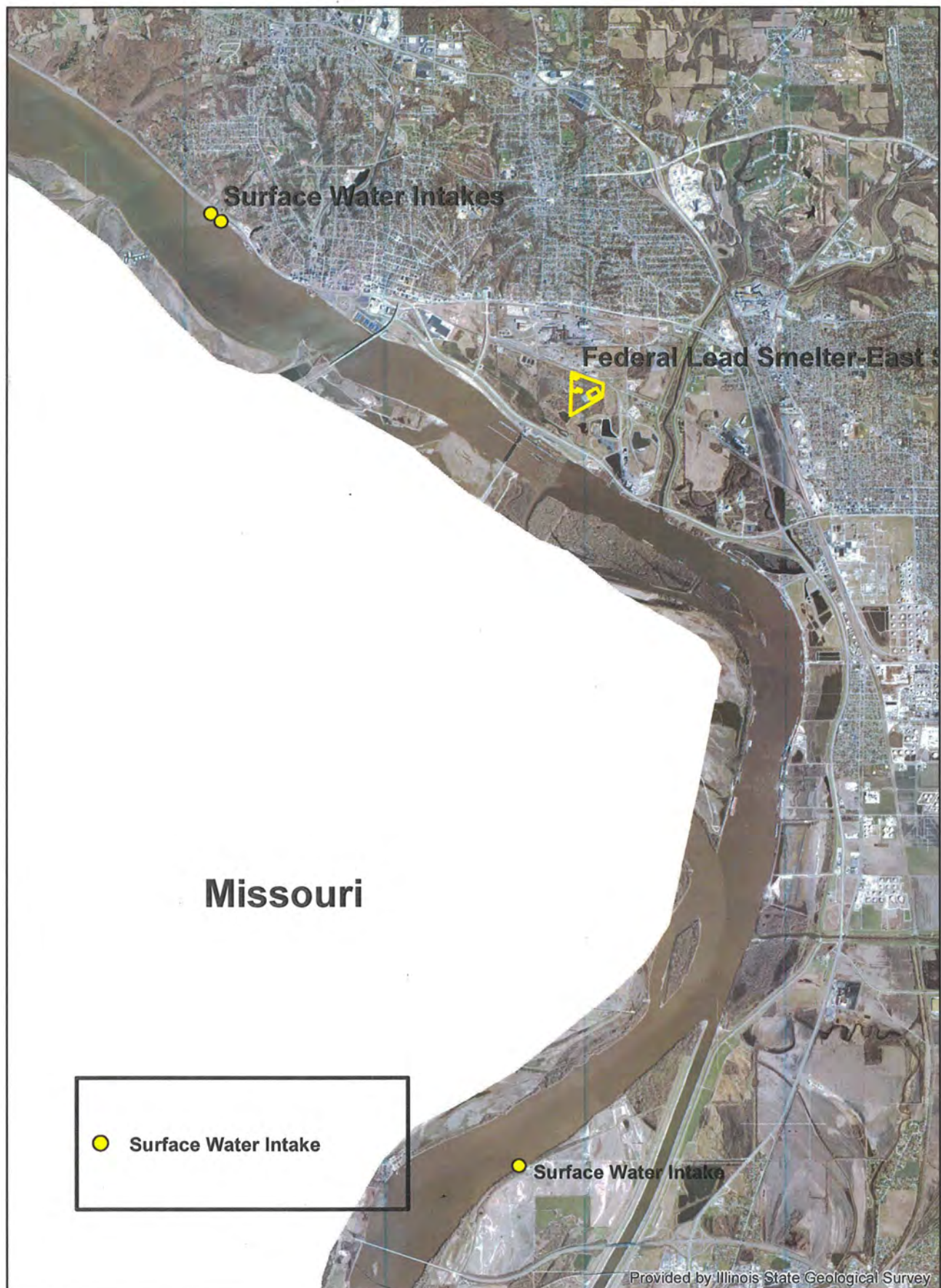


Figure 8
Surface Water



Figure 9
1941 Photo of Federal Lead Smelter and Modern Day Photo
Federal Lead Smelter - East Side

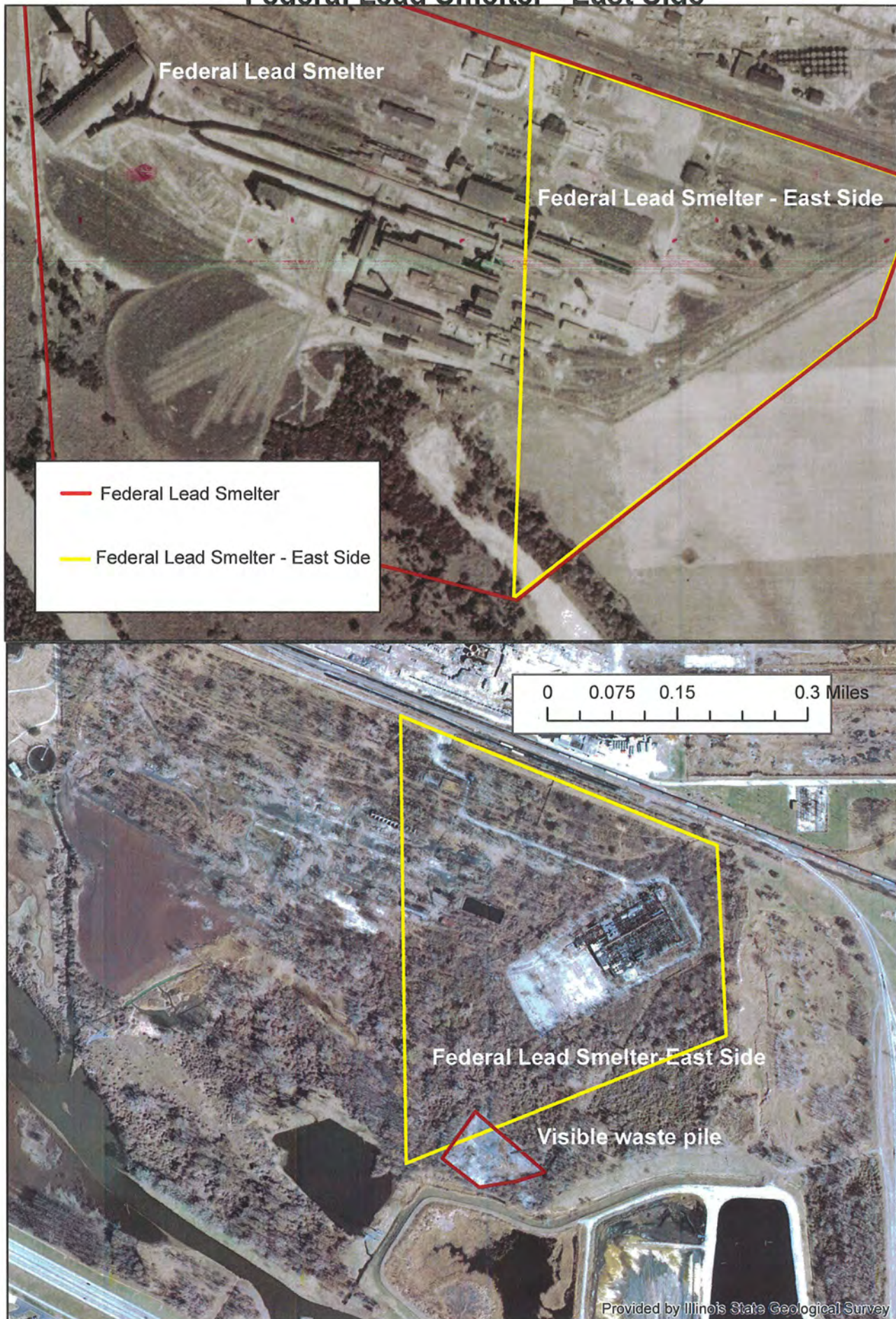


Figure 10
TCLP Sample Locations
Federal Lead Smelter-East Side



Figure 11
4-Mile Radius Map
Federal Lead Smelter-East Side

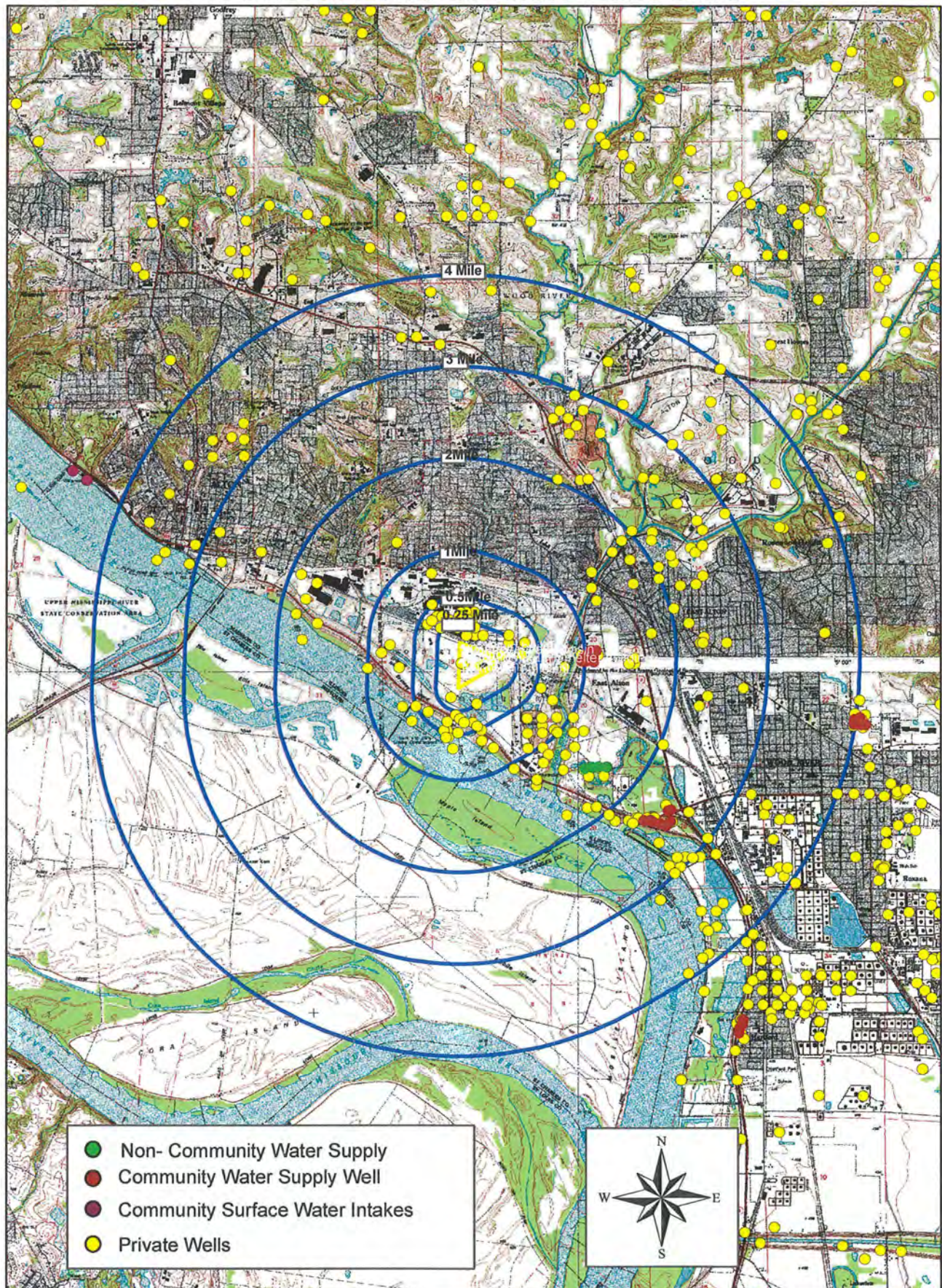


Figure 12 Wetlands Map



TABLES

Table 1
PCB Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN8	Removal Management Levels (Industrial) ug/kg	ESNL4	ESNL5	ESNL6	ESNL7	ESNL8	ESNL9				
Sampling Location :	X114		X101	X102	X103	X104	X105	X106				
Matrix :	Soil		Soil	Soil	Soil	Soil	Soil	Soil				
Units :	ug/kg		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg				
Date Sampled :	10/3/2018		10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018				
Time Sampled :	15:40		10:50	12:00	12:30	13:00	14:40	15:50				
%Solids :	86.4	94.5	55.4	79.5	68.4	74.7	76.5					
pH :												
Dilution Factor :	1	1	1	1	1	1	1					
PCB Compounds	Background	RML	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	38 U	150000	35 U	60 U	41 U	48 U	44 U	43 U				
Aroclor-1221	38 U	83000	35 U	60 U	41 U	48 U	44 U	43 U				
Aroclor-1232	38 U	72000	35 U	60 U	41 U	48 U	44 U	43 U				
Aroclor-1242	38 U	95000	35 U	60 U	41 U	48 U	44 U	43 U				
Aroclor-1248	38 U	95000	35 U	39000	150	48 U	44 U	43 U				
Aroclor-1254	38 U	44000	41	60 U	180	1500	37 J	43 U				
Aroclor-1260	38 U	99000	33 J	60 U	110	770	44 U	37 J				
Aroclor-1262	38 U		35 U	60 U	41 U	48 U	44 U	43 U				
Aroclor-1268	38 U		35 U	60 U	41 U	48 U	44 U	43 U				

Qualifiers Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Above 3 times background sample.

Table 1 (cont.)
PCB Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN8	Removal Management Levels (Industrial) ug/kg	ESNM0	ESNM1	ESNM2	ESNM3	ESNN3	ESNN4							
Sampling Location :	X114		X107	X108	X109	X110	X111	X112							
Matrix :	Soil		Soil	Soil	Soil	Soil	Soil	Soil							
Units :	ug/kg		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg							
Date Sampled :	10/3/2018		10/1/2018	10/1/2018	10/1/2018	10/2/2018	10/3/2018	10/3/2018							
Time Sampled :	15:40		16:10	16:20	17:00	12:15	11:50	11:50							
%Solids :	86.4	94.8	93.5	91.5	89.7	78.7	79.3								
pH :															
Dilution Factor :	1	1	1	1	1	1	1								
PCB Compounds	Background		BML	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag		
Aroclor-1016	38	U	150000	35	U	35	U	36	U	37	U	42	U	42	U
Aroclor-1221	38	U	83000	35	U	35	U	36	U	37	U	42	U	42	U
Aroclor-1232	38	U	72000	35	U	35	U	36	U	37	U	42	U	42	U
Aroclor-1242	38	U	95000	35	U	35	U	36	U	37	U	42	U	42	U
Aroclor-1248	38	U	95000	35	U	66		36	U	37	U	42	U	42	U
Aroclor-1254	38	U	44000	40		48		22	J	37	U	32	J	40	J
Aroclor-1260	38	U	99000	35	U	35	U	36	U	37	U	42	U	42	U
Aroclor-1262	38	U		35	U	35	U	36	U	37	U	42	U	42	U
Aroclor-1268	38	U		35	U	35	U	36	U	37	U	42	U	42	U

Qualifiers Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
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J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Above 3 time background sample.

Table 1 (cont.)
PCB Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN8	Removal Management Levels (Industrial) ug/kg	ESNN7		
Sampling Location :	X114		X113		
Matrix :	Soil		Soil		
Units :	ug/kg		ug/kg		
Date Sampled :	10/3/2018		10/3/2018		
Time Sampled :	15:40		13:50		
%Solids :	86.4		92.5		
pH :					
Dilution Factor :	1		1		
PCB Compounds	Background	BML	Result	Flag	
Aroclor-1016	38	U	150000	36	U
Aroclor-1221	38	U	83000	36	U
Aroclor-1232	38	U	72000	36	U
Aroclor-1242	38	U	95000	36	U
Aroclor-1248	38	U	95000	2500	J+
Aroclor-1254	38	U	44000	3500	J+
Aroclor-1260	38	U	99000	2500	J+
Aroclor-1262	38	U		36	U
Aroclor-1268	38	U		36	U

Qualifiers **Data Qualifier Definitions**

- U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
- UI The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- Above 3 times background sample.

Table 2
PCB Sediment
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNM9		ESNM4		ESNM5		ESNM6		ESNM7		ESNM8	
Sampling Location :	X206		X201		X202		X203		X204		X205	
Matrix :	Sediment		Sediment		Sediment		Sediment		Sediment		Sediment	
Units :	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg		ug/kg	
Date Sampled :	10/2/2018		10/2/2018		10/2/2018		10/2/2018		10/2/2018		10/2/2018	
Time Sampled :	16:50		10:25		10:50		15:05		15:05		15:50	
%Solids :	71.6		61.6		71.4		71.4		73.9		49.2	
pH :												
Dilution Factor :	1		1		1		1		1		1	
PCB Compounds	Background		Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Aroclor-1016	46	U	53	U	46	U	46	U	45	U	67	U
Aroclor-1221	46	U	53	U	46	U	46	U	45	U	67	U
Aroclor-1232	46	U	53	U	46	U	46	U	45	U	67	U
Aroclor-1242	46	U	53	U	46	U	46	U	45	U	67	U
Aroclor-1248	46	U	53	U	9.9	J	46	U	45	U	67	U
Aroclor-1254	46	U	53	U	12	J	46	U	45	U	67	U
Aroclor-1260	46	U	53	U	46	U	46	U	45	U	67	U
Aroclor-1262	46	U	53	U	46	U	46	U	45	U	67	U
Aroclor-1268	46	U	53	U	46	U	46	U	45	U	67	U

Qualifiers Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria.
	The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Table 3
TCLP Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :		MESNNO		MESNN2		MESNN5		MESNN6	
Sampling Location :		T101		T102		T103		T104	
Matrix :		Soil		Soil		Soil		Soil	
Units :		mg/L		mg/L		mg/L		mg/L	
Date Sampled :		10/3/2018		10/3/2018		10/3/2018		10/3/2018	
Time Sampled :		10:30		12:00		13:20		13:50	
%Solids :									
pH :									
Dilution Factor :		10		10		10		10	
TCLP Compounds	TCLP LIMITS	Result	Flag	Result	Flag	Result	Flag	Result	Flag
Arsenic	5	50.0	U	50	U	50.0	U	50	U
Barium	100	1000	UJ	1000	UJ	1000	UJ	1000	UJ
Cadmium	1	10.0	U	10.0	U	10.0	U	10.0	U
Chromium	5	50.0	U	50.0	U	50.0	U	50.0	U
Lead	5	566		1.8	J	49.8	J	1.3	J
Selenium	1	10.0	U	10.0	U	10.0	U	10.0	U
Silver	5	50.0	U	50.0	U	50.0	U	50.0	U

Qualifiers

Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria.
	The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Above TCLP Criteria.

Table 4
Inorganic Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESNN8		Removal Management Levels (Industrial) mg/kg	MESNL4	MESNL5	MESNL6	MESNL7	MESNL8	MESNL9						
Sampling Location :	X114			X101	X102	X103	X104	X105	X106						
Matrix :	Soil			Soil	Soil	Soil	Soil	Soil	Soil						
Units :	mg/kg			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg						
Date Sampled :	10/3/2018			10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018	10/1/2018						
Time Sampled :	15:40		10:50	12:00	12:30	13:00	14:40	15:50							
%Solids :	86.1		94.2	60.4	77.5	71.5	78	78.8							
pH :															
Dilution Factor :	1		1	1	1	1	1	1							
Inorganic Compounds	Background		RL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag		
Aluminum	14600		3400000	7470		272000		338000		197000		30900		23800	
Antimony	0.81	J	1400	270		13.4		6.1	J	40.2		4.9	J	5.7	J
Arsenic	10.5		300	68.4		4.6		3.2		13.8		7.8		23	
Barium	183		650000	96.8		233		86		279		284		208	
Beryllium	0.7		6900	0.76		8.2		14.7		9.9		0.91		1.1	
Cadmium	2.4		2900	191		35.4		12.4		663		10.4		21.2	
Calcium	6120	J		4230	J	4960	J	4010	J	7150	J	6980	J	10300	J
Chromium	27.3	J		95	J	397	J	629	J	423	J	59.4	J	61.3	J
Cobalt	8.1	J	1000	56.2	J	17.1	J	57.3	J	14.4	J	10.5	J	19.4	J
Copper	37.1		140000	1240		7340		11800		8690		879		883	
Iron	22800		2500000	271000		18100		28700		22900		17700		33200	
Lead	114			14700		1040		1060		2180		315		4490	
Magnesium	2640	J		784	J	16900	J	11400	J	18700	J	2630	J	2000	J
Manganese	578		77000	1190		1240		1380		940		882		535	
Nickel	24.7	J		392	J	233	J	253	J	332	J	71.5	J	103	J
Potassium	2160			746		828	U	645	U	699	U	2780		1680	
Selenium	4.1	UJ	18000	3.7	R	6.5	J-	1.1	J-	2190	J-	1.1	J-	4.4	UJ
Silver	0.46	J	18000	4.8	J	3.9	J	4.3	J	6.4	J	0.83	J	1.5	J
Sodium	68.5	J		167	J	259	J	76.6		313	J	70.8	J	184	J
Thallium	2.9	R		2.7	R	0.31	J-	1.4	J-	3.5	R	3.2	R	3.2	R
Vanadium	36.6		17000	3.7	J	84.1		63.5		96.7		32.6		34.2	
Zinc	416		1100000	2050		7890		11500		7550		1010		1440	
Mercury	0.056	J	140	0.14		0.73		0.097	J	1.2		0.13		0.19	
Cyanide	0.58	U	440	0.53	U	0.83	U	0.65	U	0.7	U	0.64	U	0.63	U

Qualifiers Data Qualifier Definitions

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- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
- UJ The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- Observed contamination sample.

Table 4 (Cont.)
Inorganic Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESNN8	Removal Management Levels (Industrial) mg/kg	MESNM0	MESNM1	MESNM2	MESNM3	MESNN3	MESNN4								
Sampling Location :	X114		X107	X108	X109	X110	X111	X112								
Matrix :	Soil		Soil	Soil	Soil	Soil	Soil	Soil								
Units :	mg/kg		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg								
Date Sampled :	10/3/2018		10/1/2018	10/1/2018	10/1/2018	10/2/2018	10/3/2018	10/3/2018								
Time Sampled :	15:40		16:10	16:20	17:00	12:15	11:50	11:50								
%Solids :	86.1	93.7	95.6	92.3	90.6	79.1	83.7									
pH :																
Dilution Factor :	1	1	1	1	1	1	1									
Inorganic Compounds	Background	RNL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag				
Aluminum	14600		3400000		11300		7050		6630		8810		13600		13800	
Antimony	0.81	J	1400		5.5		15.6		16.9		0.33	J	10.2		10.6	
Arsenic	10.5		300		28.2		42.7		25.2		5.4		51.7		45.2	
Barium	183		650000		160		81.7		155		151		359		211	
Beryllium	0.7		6900		0.66		0.58		0.74		0.5	J	1.1		1.1	
Cadmium	2.4		2900		75.3		184		35.3		0.97		11.1		12.2	
Calcium	6120	J			4560	J	2020	J	13800	J	2740	J	10100	J	9560	J
Chromium	27.3	J			24	J	25.1	J	19.7	J	15.6	J	40.8	J	44	J
Cobalt	8.1	J	1000		68.3	J	164	J	239	J	6	J	16.7	J	16.1	J
Copper	37.1		140000		954		2130		776		19		418		343	
Iron	22800		2500000		49600		58700		58200		12600		117000		153000	
Lead	114				60400		73300		26000		20.7		4930		4420	
Magnesium	2640	J			1600	J	1050	J	3090	J	2300	J	1020	J	1020	J
Manganese	578		77000		361		339		450		289		678		729	
Nickel	24.7	J			203	J	370	J	182	J	18.7	J	62.7	J	58.7	J
Potassium	2160				944		1120		1430		1620		1330		1360	
Selenium	4.1	UJ	18000		2.8	J-	2.2	J-	3.8	UJ	3.9	UJ	4.4	R	4.2	R
Silver	0.46	J	18000		4.5	J	19.3	J	2.9	J	0.21	J	2.5	J	2.6	J
Sodium	68.5	J			163	J	118	J	271	J	77.7	J	903		1070	
Thallium	2.9	R			2.7	R	2.6	R	2.7	R	2.8	R	3.2	R	3	R
Vanadium	36.6		17000		17.6		16.2		13.8		24.2		27.1		26.7	
Zinc	416		1100000		1570		5070		7320		65.8		542		502	
Mercury	0.056	J	140		0.44		0.25		0.085	J	0.26	J	0.71		0.52	
Cyanide	0.58	U	440		0.53	U	0.52	U	0.54	U	0.65	J+	0.63	U	0.75	J+

Qualifiers Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Observed contamination sample.

Table 4 (Cont.)
Inorganic Soil
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESNN8	Removal Management Levels (Industrial) mg/kg	MESNN7		
Sampling Location :	X114		X113		
Matrix :	Soil		Soil		
Units :	mg/kg		mg/kg		
Date Sampled :	10/3/2018		10/3/2018		
Time Sampled :	15:40		13:50		
%Solids :	86.1		92.6		
pH :					
Dilution Factor :	1		1		
Inorganic Compounds	Background		RML	Result	Flag
Aluminum	14600		3400000	47100	
Antimony	0.81	J	1400	10.3	
Arsenic	10.5		300	20.6	
Barium	183		650000	149	
Beryllium	0.7		6900	0.75	
Cadmium	2.4		2900	66.2	
Calcium	6120	J		7420	J
Chromium	27.3	J		381	J
Cobalt	8.1	J	1000	27.7	J
Copper	37.1		140000	1890	
Iron	22800		2500000	94400	
Lead	114			3170	
Magnesium	2640	J		1540	J
Manganese	578		77000	492	
Nickel	24.7	J		217	J
Potassium	2160			948	
Selenium	4.1	UJ	18000	32.8	J-
Silver	0.46	J	18000	6	J
Sodium	68.5	J		87.7	J
Thallium	2.9	R		2.7	R
Vanadium	36.6		17000	341	
Zinc	416		1100000	2740	
Mercury	0.056	J	140	0.4	
Cyanide	0.58	U	440	0.54	U

Qualifiers Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Above 3 times background sample.

Table 5
Inorganic Sediment
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	MESNM9	MESNM4	NESNM5		MESNM6	MESNM7	MESNM8					
Sampling Location :	X206	X201	X202		X203	X204	X205					
Matrix :	Sediment	Sediment	Sediment		Sediment	Sediment	Sediment					
Units :	mg/kg	mg/kg	mg/kg		mg/kg	mg/kg	mg/kg					
Date Sampled :	10/2/2018	10/2/2018	10/2/2018		10/2/2018	10/2/2018	10/2/2018					
Time Sampled :	16:50	10:25	0:50		15:05	15:05	15:50					
%Solids :	60.3	60.4	70.5		71.5	70.5	41.3					
pH :												
Dilution Factor :	1	1	1		1	1	1					
Inorganic Compounds	Background	Result	Flag	Result	Flag	Result	Flag	Result	Flag			
Aluminum	8380	25900		21600		15800		11600		24700		
Antimony	10	U	1.1	J	0.67	J	0.53	J	0.53	J	1.1	J
Arsenic	6.9		26.4		10.4		14.8		9.9		8.2	
Barium	123		300		188		205		141		354	
Beryllium	0.59	J	1.2		1.2		0.73		0.53	J	1	J
Cadmium	0.83	U	5.2		4.3		1.7		1.3		4.2	
Calcium	14400	J	3120	J	2840	J	4370	J	3020	J	8070	J
Chromium	14.4	J	40.5	J	35.6	J	23.2	J	17.8	J	57.2	J
Cobalt	6.5	J	10.7	J	9.7	J	10.6	J	8	J	11.7	J
Copper	63.3		104		330		21.4		15.1		116	
Iron	12700		27100		14100		24400		17600		38400	
Lead	26.5		104		65.8		48.8		37.2		195	
Magnesium	1600	J	3690	J	3130	J	2960	J	2160	J	5950	J
Manganese	282		454		563		988		709		641	
Nickel	13.3	J	36.3	J	35.7	J	22.8	J	17	J	68.3	J
Potassium	974		5950		1380		1740		1300		2870	
Selenium	5.8	UJ	0.99	J-	5	UJ	4.9	UJ	5	UJ	8.5	UJ
Silver	0.17	J	0.53	J	0.42	J	0.48	J	0.37	J	3.4	J
Sodium	97.8	J	694	J	134	J	100	J	76.8	J	193	J
Thallium	4.1	R	4.1	R	3.5	R	3.5	R	3.5	R	6.1	R
Vanadium	34		65.2		34.8		36		26.8		54.4	
Zinc	51.6		403		402		190		139		917	
Mercury	0.051	J	0.14	J	0.11	J	0.048	J	0.047	J	0.52	
Cyanide	0.83	U	0.83	U	0.71	UJ	0.7	UJ	0.71	UJ	1.2	J+

Qualifiers Data Qualifier Definitions

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria.
	The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
	Above 3 times background sample.

Table 6
Volatile Surface Water
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN1	
Sampling Location :	S101	
Matrix :	Water	
Units :	Ug/L	
Date Sampled :	10/3/2018	
Time Sampled :	10:00	
%Solids :		
pH :	1.3	
Dilution Factor :	1	
VOC Compounds	Result	Flag
Dichlorodifluoromethane	0.50	U
Chloromethane	0.50	U
Vinyl chloride	0.50	U
Bromomethane	0.50	U
Chloroethane	0.50	U
Trichlorofluoromethane	0.50	U
1,1-Dichloroethene	0.50	UJ
1,1,2-Trichloro-1,2,2-trifluoroethane	0.50	U
Acetone	11	
Carbon disulfide	0.50	U
Methyl Acetate	0.50	U
Methylene chloride	0.50	U
trans-1,2-Dichloroethene	0.50	UJ
Methyl tert-butyl Ether	0.50	U
1,1-Dichloroethane	0.50	U
cis-1,2-Dichloroethene	0.50	UJ
2-Butanone	5.0	U
Bromochloromethane	0.50	U
Chloroform	0.50	U
1,1,1-Trichloroethane	0.50	U
Cyclohexane	0.50	U
Carbon tetrachloride	0.50	U
Benzene	0.50	U
1,2-Dichloroethane	0.50	U
Trichloroethene	0.5	UJ
Methylcyclohexane	0.50	U
1,2-Dichloropropane	0.50	U
Bromodichloromethane	0.50	U
cis-1,3-Dichloropropene	0.50	U
4-Methyl-2-pentanone	5.0	U
Toluene	0.50	UJ
trans-1,3-Dichloropropene	0.50	U
1,1,2-Trichloroethane	0.50	U
Tetrachloroethene	0.50	UJ
2-Hexanone	5.0	U
Dibromochloromethane	0.50	U
1,2-Dibromoethane	0.50	U
Chlorobenzene	0.50	U
Ethylbenzene	0.50	UJ
o-Xylene	0.50	UJ
m,p-Xylene	0.50	UJ
Styrene	0.50	UJ
Bromoform	0.50	U
Isopropylbenzene	0.50	UJ
1,1,2,2-Tetrachloroethane	0.50	U
1,3-Dichlorobenzene	0.50	U
1,4-Dichlorobenzene	0.50	U
1,2-Dichlorobenzene	0.50	U
1,2-Dibromo-3-chloropropane	0.50	U
1,2,4-trichlorobenzene	0.50	U
1,2,3-Trichlorobenzene	0.50	U
Total Alkanes		
Benzene, 1,2,4-trimethyl-	0.52	J

Table 7
Semi Volatile Surface Water
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN1	
Sampling Location :	S101	
Matrix :	Water	
Units :	Ug/L	
Date Sampled :	10/3/2018	
Time Sampled :	10:00	
%Solids :		
pH :	1.3	
Dilution Factor :	1	
SVOC Compounds	Result	Flag
1,4-Dioxane	2.0	U
Benzaldehyde	10	U
Phenol	1.5	J
Bis(2-Chloroethyl)ether	10	U
2-Chlorophenol	5.0	U
2-Methylphenol	10	U
2,2-oxybis(1-Chloropropane)	10	U
Acetophenone	10	U
4-Methylphenol	10	U
N-Nitroso-di-n-propylamine	5.0	U
Hexachloroethane	5.0	U
Nitrobenzene	5.0	U
Isophorone	5.0	U
2-Nitrophenol	5.0	U
2,4-Dimethylphenol	5.0	U
Bis(2-Chloroethoxy)methane	5.0	U
2,4-Dichlorophenol	5.0	U
Naphthalene	5.0	U
4-Chloroaniline	10	U
Hexachlorobutadiene	5.0	U
Caprolactam	10	U
4-Chloro-3-methylphenol	5.0	U
2-Methylnaphthalene	5.0	U
Hexachlorocyclopentadiene	10	U
2,4,6-Trichlorophenol	5.0	U
2,4,5-Trichlorophenol	5.0	U
1,1-Biphenyl	5.0	U
2-Chloronaphthalene	5.0	U
2-Nitroaniline	5.0	UJ
Dimethylphthalate	5.0	U
2,6-Dinitrotoluene	5.0	U
Acenaphthylene	5.0	U
3-Nitroaniline	10	UJ
Acenaphthene	5.0	U
2,4-Dinitrophenol	10	UJ
4-Nitrophenol	10	UJ
Dibenzofuran	5.0	U
2,4-Dinitrotoluene	5.0	U
Diethylphthalate	5.0	U
Fluorene	5.0	U
4-Chlorophenyl-phenylether	5.0	U
4-Nitroaniline	10	UJ

Sample Number :	ESNN1	
Sampling Location :	S101	
Matrix :	Water	
Units :	Ug/L	
Date Sampled :	10/3/2018	
Time Sampled :	10:00	
%Solids :		
pH :	1.3	
Dilution Factor :	1	
SVOC Compounds	Result	Flag
4,6-Dinitro-2-methylphenol	10	U
N-Nitrosodiphenylamine	5.0	U
1,2,4,5-Tetrachlorobenzene	5.0	U
4-Bromophenyl-phenylether	5.0	U
Hexachlorobenzene	5.0	U
Atrazine	10	U
Pentachlorophenol	10	U
Phenanthrene	5.0	U
Anthracene	5.0	U
Carbazole	10	U
Di-n-butylphthalate	5.0	U
Fluoranthene	10	U
Pyrene	5.0	U
Butylbenzylphthalate	5.0	U
3,3-Dichlorobenzidine	10	U
Benzo(a)anthracene	5.0	U
Chrysene	5.0	U
Bis(2-ethylhexyl)phthalate	5.0	U
Di-n-octyl phthalate	10	U
Benzo(b)fluoranthene	5.0	U
Benzo(k)fluoranthene	5.0	U
Benzo(a)pyrene	5.0	U
Indeno(1,2,3-cd)pyrene	5.0	U
Dibenzo(a,h)anthracene	5.0	U
Benzo(g,h,i)perylene	5.0	U
2,3,4,6-Tetrachlorophenol	5.0	U
Total Alkanes	5.9	
Naphthalene	0.10	U
2-Methylnaphthalene	0.10	U
Acenaphthylene	0.10	U
Acenaphthene	0.10	U
Fluorene	0.10	U
Pentachlorophenol	0.20	U
Phenanthrene	0.10	U
Anthracene	0.10	U
Fluoranthene	0.10	U
Pyrene	0.10	U
Benzo(a)anthracene	0.10	U
Chrysene	0.10	U
Benzo(b)fluoranthene	0.10	U
Benzo(k)fluoranthene	0.10	U
Benzo(a)pyrene	0.10	U
Indeno(1,2,3-cd)pyrene	0.10	U
Dibenzo(a,h)anthracene	0.10	U
Benzo(g,h,i)perylene	0.10	U

U

Non Detect

Table 8
Pesticide Surface Water
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN1	
Sampling Location :	S101	
Matrix :	Water	
Units :	Ug/L	
Date Sampled :	10/3/2018	
Time Sampled :	10:00	
%Solids :		
pH :	1.3	
Dilution Factor :	1	
Pesticide Compounds	Result	Flag
alpha-BHC	0.050	U
beta-BHC	0.050	U
delta-BHC	0.050	U
gamma-BHC (Lindane)	0.050	U
Heptachlor	0.050	U
Aldrin	0.050	U
Heptachlor epoxide	0.050	U
Endosulfan I	0.050	U
Dieldrin	0.10	U
4,4-DDE	0.10	U
Endrin	0.10	U
Endosulfan II	0.10	U
4,4-DDD	0.10	U
Endosulfan Sulfate	0.10	U
4,4-DDT	0.10	U
Methoxychlor	0.50	U
Endrin ketone	0.10	U
Endrin Aldehyde	0.10	U
cis-Chlordane	0.050	U
trans-Chlordane	0.050	U
Toxaphene	5.0	U

Table 9
PCB Surface Water
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN1	
Sampling Location :	S101	
Matrix :	Water	
Units :	Ug/L	
Date Sampled :	10/3/2018	
Time Sampled :	10:00	
%Solids :		
pH :	1.3	
Dilution Factor :	1	
PCB Compounds	Result	Flag
Aroclor-1016	1.0	U
Aroclor-1221	1.0	U
Aroclor-1232	1.0	U
Aroclor-1242	1.0	U
Aroclor-1248	1.0	U
Aroclor-1254	1.0	U
Aroclor-1260	1.0	U
Aroclor-1262	1.0	U
Aroclor-1268	1.0	U

U Non Detect

Table 10
Inorganic Surface Water
Federal Lead Smelter-East Side
Alton, IL

Sample Number :	ESNN1	
Sampling Location :	S101	
Matrix :	Water	
Units :	Ug/L	
Date Sampled :	10/3/2018	
Time Sampled :	10:00	
%Solids :		
pH :	1.3	
Dilution Factor :	1	
Inorganic Compounds	Result	Flag
Aluminum	200	U
Antimony	60.0	U
Arsenic	10.0	U
Barium	200	U
Beryllium	5.0	U
Cadmium	5.0	U
Calcium	52600	
Chromium	10.0	U
Cobalt	50.0	U
Copper	25.0	U
Iron	2470	
Lead	10	U
Magnesium	5000	U
Manganese	447	
Nickel	40	U
Potassium	6510	
Selenium	35.0	U
Silver	10.0	U
Sodium	2060	J
Thallium	25.0	U
Vanadium	50.0	U
Zinc	60.0	U
Hardness	138	
Mercury	0.2	U
Cyanide	10.2	J+

U Non Detect

Table 11
XRF Results
Federal Lead Smelter - East Side
Alton, IL

Date	Time	Reading	Elapsed Time	Pb	S	K	Ca	Ti	Cr	Mn	Fe	Cu	Zn	As	Rb	Cd
10/1/2018	9:09:02	#5	14.96	530	ND	2077	22040	754	126	672	34983	2288	4323	ND	28	ND
10/1/2018	9:12:19	#6	14.95	193	ND	2110	10550	532	67	238	6763	878	1129	ND	20	ND
10/1/2018	9:17:05	#7	14.98	4484	ND	5042	3644	895	ND	208	17150	257	1277	ND	41	ND
10/1/2018	9:23:28	#8	14.97	639	ND	1251	2118	515	ND	309	11939	994	1600	ND	26	ND
10/1/2018	9:29:21	#11	14.98	347	ND	ND	2460	ND	2202	3590	22777	15258	8970	ND	ND	ND
10/1/2018	9:35:06	#12	14.98	2309	ND	4029	6985	754	ND	271	9459	190	376	ND	53	ND
10/1/2018	9:38:47	#13	14.97	4457	ND	3284	10470	1141	ND	350	28273	522	837	ND	23	ND
10/1/2018	9:42:33	#14	14.98	2437	ND	1495	10886	491	ND	284	16254	1122	1652	ND	28	ND
10/1/2018	9:44:48	#15	14.99	3540	ND	4345	6310	1578	ND	306	58526	260	252	ND	43	ND
10/1/2018	9:46:54	#16	14.98	12554	ND	5910	ND	1630	ND	1137	687846	1300	1661	ND	ND	ND
10/1/2018	9:59:12	#17	14.98	20084	ND	2104	6761	532	ND	290	29330	996	1672	580	44	592
10/1/2018	10:02:17	#18	14.97	2749	ND	4872	8709	1350	135	672	15913	1760	1791	ND	30	106
10/1/2018	10:09:49	#19	14.97	536	ND	ND	1899	606	417	920	6624	5268	4131	ND	ND	ND
10/1/2018	10:14:43	#20	14.99	644	ND	1577	6076	652	138	443	10169	2901	2909	ND	ND	ND
10/1/2018	10:18:44	#21	14.98	810	ND	2663	9077	842	ND	492	9014	724	782	ND	35	ND
10/1/2018	10:20:48	#22	14.97	492	ND	ND	477	ND	143	473	5278	43727	5190	ND	ND	ND
10/1/2018	10:28:12	#23	14.98	723	ND	6947	5563	1551	ND	379	11777	255	323	ND	50	ND
10/1/2018	10:33:37	#24	14.94	149	ND	977	978	607	ND	237	7934	155	789	ND	23	76
10/1/2018	10:39:14	#25	14.97	76	ND	3333	ND	1314	ND	82	19375	228	1046	ND	82	107
10/1/2018	10:44:05	#26	14.96	146	ND	2914	3907	922	ND	188	12621	176	783	ND	33	ND
10/1/2018	10:47:15	#27	14.94	135	ND	1672	2429	283	ND	122	9506	181	664	ND	27	85
10/1/2018	10:49:04	#28	14.96	243	ND	1092	1883	272	ND	301	5556	1108	1356	ND	ND	ND
10/1/2018	10:50:00	#29	14.98	522	ND	ND	2019	681	110	512	8279	3150	3806	ND	13	ND
10/1/2018	10:56:43	#30	14.98	467	ND	3678	5402	1510	136	522	12944	1360	3533	ND	38	ND
10/1/2018	11:03:54	#31	14.96	478	ND	ND	2788	418	116	551	7478	3598	4008	ND	ND	ND
10/1/2018	11:11:09	#32	14.96	162	ND	716	2671	677	158	648	7040	1797	2458	ND	ND	ND
10/1/2018	11:14:02	#33	14.98	522	ND	ND	ND	1423	326	1202	113581	6547	5322	ND	ND	ND
10/1/2018	11:18:00	#34	14.97	392	ND	ND	ND	ND	184	1082	58898	9095	16624	ND	ND	ND
10/1/2018	11:38:56	#35	14.97	288	ND	ND	2107	1829	177	1082	8310	2529	2314	ND	ND	ND
10/1/2018	11:46:07	#36	14.97	569	ND	ND	2271	1473	231	667	28791	5192	2961	ND	16	ND
10/1/2018	11:51:03	#37	14.98	376	ND	724	4675	ND	149	703	5198	3508	2322	ND	ND	ND
10/1/2018	11:52:05	#38	14.97	1714	ND	992	2940	2343	295	764	31394	6447	6995	ND	ND	398
10/1/2018	12:07:18	#39	14.97	309	ND	852	1364	572	112	602	7547	2404	2088	ND	ND	ND
10/1/2018	12:08:32	#40	14.97	249	ND	ND	1703	966	117	834	6958	2675	1973	ND	ND	ND
10/1/2018	12:11:46	#41	14.97	257	ND	6150	4127	1424	ND	251	9225	89	159	ND	40	ND
10/1/2018	12:15:34	#42	14.93	253	ND	4063	11943	833	ND	504	9053	122	316	ND	47	ND
10/1/2018	13:33:54	#43	14.97	342	ND	3388	8825	589	ND	397	9457	481	622	ND	25	ND
10/1/2018	13:35:52	#44	14.98	480	ND	3636	3264	1264	ND	306	16714	645	777	ND	40	ND
10/1/2018	13:59:07	#45	14.97	141	ND	5046	10305	1152	ND	406	11654	133	228	ND	49	ND
10/1/2018	14:05:12	#46	14.98	268	ND	6720	4145	1181	ND	361	10755	86	157	ND	59	ND
10/1/2018	14:15:47	#47	14.97	202	ND	2392	3121	568	69	190	8725	188	366	ND	46	ND
10/1/2018	14:23:04	#48	14.96	233	ND	1924	16336	393	ND	310	9400	323	648	ND	14	ND
10/1/2018	14:25:32	#49	14.98	368	ND	3366	10156	828	ND	324	11932	386	675	ND	31	ND
10/1/2018	14:45:56	#50	14.98	2853	ND	3978	18906	1113	ND	467	22112	498	1043	ND	41	ND
10/1/2018	15:06:58	#51	14.99	47661	24097	6421	6692	2302	ND	428	70733	1238	1981	ND	ND	ND
10/1/2018	15:19:05	#52	14.98	143205	ND	2393	1832	731	ND	264	98376	2225	8292	ND	ND	145
10/1/2018	15:34:25	#53	15	6545	ND	4379	7309	1148	95	324	20560	635	4324	526	52	ND
10/1/2018	15:50:42	#54	14.99	20337	ND	3947	8251	1648	ND	227	36931	881	1923	ND	ND	ND

Table 11
XRF Results
Federal Lead Smelter - East Side
Alton, IL

Date	Time	Reading	Elapsed Time	Pb	S	K	Ca	Ti	Cr	Mn	Fe	Cu	Zn	As	Rb	Cd
10/2/2018	8:38:18	#4	14.94	44	ND	2732	793	1076	ND	271	9820	ND	182	ND	59	ND
10/2/2018	8:41:14	#5	14.94	48	ND	3331	1113	1320	ND	167	7897	ND	163	ND	42	ND
10/2/2018	8:44:53	#6	14.94	39	ND	5237	1524	1719	ND	307	11864	75	326	ND	53	ND
10/2/2018	8:47:53	#8	14.94	37	ND	2266	886	573	ND	218	5496	141	212	ND	42	ND
10/2/2018	8:54:07	#9	14.95	71	ND	6041	1464	1692	ND	394	14951	136	395	ND	60	ND
10/2/2018	8:54:51	#10	14.98	74	ND	6980	880	2099	ND	395	17890	156	333	ND	61	ND
10/2/2018	9:12:29	#11	14.95	73	ND	7049	1459	1278	ND	397	12589	556	982	ND	46	ND
10/2/2018	9:13:08	#12	14.95	54	ND	7760	1304	1216	ND	325	10204	280	637	ND	40	ND
10/2/2018	9:46:36	#13	14.96	ND	ND	3283	1905	ND	51	179	5780	ND	83	ND	30	ND
10/2/2018	9:47:08	#14	14.96	78	ND	4734	2310	1168	ND	699	14947	250	329	ND	54	ND
10/2/2018	10:00:04	#15	14.96	76	ND	6015	1599	1860	ND	484	17317	ND	ND	ND	71	ND
10/2/2018	10:10:41	#16	14.97	79	ND	5479	1435	2044	76	334	18735	ND	221	ND	80	ND
10/2/2018	11:09:15	#17	15	ND	ND	8107	12987	1066	ND	264	8545	ND	81	ND	60	ND
10/2/2018	11:19:35	#18	14.98	ND	ND	4557	5033	1021	ND	216	10141	ND	54	ND	52	ND
10/2/2018	11:22:46	#19	14.98	ND	ND	5720	8987	925	ND	207	10748	89	55	ND	67	ND
10/2/2018	11:26:12	#20	14.97	ND	ND	5444	9308	821	ND	182	7075	ND	ND	ND	55	ND
10/2/2018	11:28:22	#21	14.98	ND	ND	8019	6171	1482	69	187	11818	ND	65	ND	88	ND
10/2/2018	11:32:32	#22	14.98	57	ND	6672	3632	1537	ND	329	11802	ND	61	ND	69	ND
10/2/2018	11:43:55	#23	14.97	276	ND	7341	5288	1486	ND	486	12940	121	265	ND	81	ND
10/2/2018	13:58:05	#24	14.96	38	ND	2464	996	1009	ND	533	11971	ND	79	ND	43	ND
10/2/2018	13:58:46	#25	14.96	ND	ND	3918	2249	1521	ND	460	13394	68	135	ND	50	ND
10/2/2018	14:38:14	#26	14.97	69	ND	3174	2330	1088	49	184	11106	62	967	ND	34	ND
10/2/2018	14:40:51	#27	14.97	97	ND	3915	2817	1398	ND	327	19380	77	748	ND	45	ND
10/2/2018	15:45:41	#32	14.96	ND	ND	4498	3895	1462	65	244	8611	ND	ND	ND	48	ND
10/3/2018	10:34:05	#2	14.96	2732	ND	2810	8837	834	ND	349	48542	287	479	ND	30	ND
10/3/2018	12:35:29	#3	14.98	133	ND	1160	28295	ND	ND	200	3601	83	1083	ND	11	ND
10/3/2018	12:38:50	#4	14.94	953	ND	1279	8057	464	ND	206	12561	190	415	ND	25	ND
10/3/2018	12:40:52	#5	15	3190	ND	2150	8180	1554	90	601	52188	2482	2781	ND	22	ND
10/3/2018	12:42:54	#6	14.99	2454	ND	2412	26993	2293	216	418	76880	1441	2377	ND	21	ND
10/3/2018	14:03:16	#7	14.97	266	ND	5967	3825	1463	77	366	14107	122	316	ND	67	ND
10/3/2018	14:06:28	#8	14.99	108	ND	5743	2281	1326	ND	193	13389	ND	261	ND	71	ND
10/3/2018	14:07:24	#9	14.96	147	ND	7631	2715	1938	97	283	17171	93	271	ND	83	ND
10/3/2018	14:17:55	#10	14.99	150	ND	5884	3565	1787	ND	555	17312	ND	622	ND	49	ND
10/3/2018	14:26:29	#11	14.98	107	ND	6373	4067	2331	73	455	13864	ND	290	ND	64	ND
10/3/2018	14:28:18	#12	15	88	ND	5569	3573	1847	ND	361	11963	74	330	ND	64	ND
10/3/2018	14:29:57	#13	14.98	159	ND	8368	4125	2096	ND	448	22915	ND	442	ND	63	ND
10/3/2018	14:33:25	#14	14.98	83	ND	6480	3935	1985	ND	393	21514	ND	334	ND	47	ND

Table 12
Sample Summary Table
Federal Lead Smelter - East Side
Site Inspection - October 2018

Sample Number	Date/Time	Depth	Analysis	Sample Description
Sediment Sample				
X201	10/2/2018	0-4"	TM/PCB	Collected from north side of intermittent stream from 0-4 inches. Material was made up of silty clay.
X202	10/2/2018	2-6"	TM/PCB	Collected from intermittent stream from 2-6 inches. Fine sand with some silt.
X203	10/2/2018	0-5"	TM/PCB	Collected from the end of ditch before entering into perennial waterway. Sandy dark clay with some silt.
X204	10/2/2018	0-5"	TM/PCB	Collected from the end of ditch before entering into perennial waterway. Sandy dark clay with some silt. Sample is a duplicate of X203.
X205	10/2/2018	0-5"	TM/PCB	Collected from perennial waterway from 0-5 inches.
X206	10/2/2018	0-6"	TM/PCB	Collected from Alton Park for sediment background sample. Gray silty clay.
Soil Sample				
X101	10/1/2018	surface	TM/PCB	Collected from south side of building in open area with no vegetation. Slag with metal fragments and cinders; grayish brown cinder fines. TCLP 103
X102	10/1/2018	surface	TM/PCB	Collected from base of pile located in wetlands. Grayish sandy material.
X103	10/1/2018	surface	TM/PCB	Collected from waster pile. White powdery gray fine sandy material. Slag and pieces of aluminum present.
X104	10/1/2018	surface	TM/PCB	Collected from pile in wetlands. Gray sandy material.
X105	10/1/2018	surface	TM/PCB	Collected from potential wetland. Light brown loam.
X106	10/1/2018	surface	TM/PCB	Sample consisted of low % slag material, fine silt and trace cinders.
X107	10/1/2018	0-2 inches	TM/PCB	Collected from waste material that consisted of brick shards, fine gray sand with small chunks of slag.
X108	10/1/2018	0-2 inches	TM/PCB	Material was light gray sand with small chunks of slag. Sandy material consisted of slag fines. TCLP 101 was also collected from this location.
X109	10/1/2018	0-2 inches	TM/PCB	Material was light gray sand with small chunks of slag. Sandy material consisted of slag fines and brick shards.
X110	10/2/2018	0-2 inches	TM/PCB	Sample was light brown loam with low % clay. MS/MSD.
X111	10/3/2018	0-2 inches	TM/PCB	Slag material with fine silt and trace cinders.
X112	10/3/2018	0-2 inches	TM/PCB	Slag material with fine silt and trace cinders. X112 is a duplicate of X111. TCLP 102 was also collected from this location.
X113	10/3/2018	0-2 inches	TM/PCB	Material was fine silt with trace cinders and slag chunks. TCLP 104 was collected from this location.
X114	10/3/2018	0-3 inches	TM/PCB	Light brown silt. Collected on north side of Clara Barton school and used as the background sample.
Surface Water Sample				
S101	10/3/2018		Target Compound List	Collected sample from concrete lined surface impoundment. MS/MSD. Water was clear with no odor or sheen and covered with duckweed.

ATTACHMENTS

Photo sheets



DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1050

PHOTO by: Tony Wasilewski

COMMENTS: X101 was collected from the surface; material consisted of slag with metal fragments and cinders; grayish brown cinder fines. Taken from south side of building structure.



DATE: 10/01/2018

TIME: 1050

PHOTO by: Tony Wasilewski

COMMENTS: X101 was collected from the surface; material consisted of slag with metal fragments and cinders; grayish brown cinder fines. Taken from south side of building structure.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/0/2018

TIME: 12:00

PHOTO by: Tony Wasilewski

COMMENTS: X102 was collected at base of pile in wetlands. Grayish sandy material; silt.



DATE: 10/01/2018

TIME: 1200

PHOTO by: Tony Wasilewski

COMMENTS: X102 was collected at base of pile in wetlands. Grayish sandy material; silt.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1230

PHOTO by: Tony Wasilewski

COMMENTS: X103 was collected from the surface of the waste pile located on the south end of the site. Consisted of white powdery and gray fine sandy material.



DATE: 10/01/2018

TIME: 1230

PHOTO by: Tony Wasilewski

COMMENTS: X103 was collected from the surface of the waste pile located on the south end of the site. Consisted of white powdery and gray fine sandy material.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1300

PHOTO by: Tony Wasilewski

COMMENTS: X104 was collected from the waste pile and in a wetland area; gray sandy material.



DATE: 10/01/2018

TIME: 1300

PHOTO by: Tony Wasilewski

COMMENTS: X104 was collected from the waste pile and in a wetland area; gray sandy material.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1440

PHOTO by: Tony Wasilewski

COMMENTS: Sample X105 was collected from the surface in a wetland. Soil was light brown loam.



DATE: 10/01/2018

TIME: 1440

PHOTO by: Tony Wasilewski

COMMENTS: Sample X105 was collected from the surface in a wetland. Soil was light brown loam.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1550

PHOTO by: Tony Wasilewski

COMMENTS: X106 was collected from the surface. Consisted of fine silt and trace cinders. Low % of slag material.



DATE: 10/01/2018

TIME: 1550

PHOTO by: Tony Wasilewski

COMMENTS: X106 was collected from the surface. Consisted of fine silt and trace cinders. Low % of slag material.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1610

PHOTO by: Tony Wasilewski

COMMENTS: Sample X107 was collected from waste material that consisted of brick shards, fine gray sand with small chunks of slag material.



DATE: 10/01/2018

TIME: 1610

PHOTO by: Tony Wasilewski

COMMENTS: Sample X107 was collected from waste material that consisted of brick shards, fine gray sand with small chunks of slag material.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1620

PHOTO by: Tony Wasilewski

COMMENTS: X108 was collected from 0-2 inches and consisted of light gray sandy material with small chunks of slag.



DATE: 10/01/2018

TIME: 1620

PHOTO by: Tony Wasilewski

COMMENTS: X108 was collected from 0-2 inches and consisted of light gray sandy material with small chunks of slag.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/01/2018

TIME: 1700

PHOTO by: Tony Wasilewski

COMMENTS: X109 was collected from 0-2 inches from light gray sandy material with small chunks of slag and brick shards.



DATE: 10/01/2018

TIME: 1700

PHOTO by: Tony Wasilewski

COMMENTS: X109 was collected from 0-2 inches from light gray sandy material with small chunks of slag and brick shards.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/02/2018

TIME: 1215

PHOTO by: Tony Wasilewski

COMMENTS: Sample X110 was collected from 0-2 inches. Light brown loam with low % clay. Collected the MS/MSD.



DATE: 10/02/2018

TIME: 1215

PHOTO by: Tony Wasilewski

COMMENTS: Sample X110 was collected from 0-2 inches. Light brown loam with low % clay. Collected the MS/MSD.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/03/2018

TIME: 1150

PHOTO by: Tony Wasilewski

COMMENTS: Sample X111 and X112 was collected from 0-2 inches. Fine silt with trace cinders and slag material. X112 is a duplicate of X111.



DATE: 10/03/2018

TIME: 1150

PHOTO by: Tony Wasilewski

COMMENTS: T102 was collected from the same location as X111 & X112





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/03/2018

TIME: 1350

PHOTO by: Tony Wasilewski

COMMENTS: Sample X113 was collected from fine silt material with trace cinders and slag chunks. TCLP sample T104 was collected from this same location.



DATE: 10/03/2018

TIME: 1350

PHOTO by: Tony Wasilewski

COMMENTS: Sample X113 was collected from fine silt material with trace cinders and slag chunks. TCLP sample T104 was collected from this same location.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/03/2018

TIME: 1540

PHOTO by: Tony Wasilewski

COMMENTS: Sample X114 was collected from 0-3 inches from the Clara Barton School. Light brown silt. This sample was used as the background sample.



DATE: 10/03/2018

TIME: 1540

PHOTO by: Tony Wasilewski

COMMENTS: Sample X114 was collected from 0-3 inches from the Clara Barton School. Light brown silt. This sample was used as the background sample.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/03/2018

TIME: 1030

PHOTO by: Tony Wasilewski

COMMENTS: Sample T101 was collected from 0-2 inches from the same location as X108.



DATE: 10/03/2018

TIME: 1030

PHOTO by: Tony Wasilewski

COMMENTS: Sample T101 was collected from 0-2 inches from the same location as X108.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/03/2018

TIME: 1320

PHOTO by: Tony Wasilewski

COMMENTS: Sample T103 was collected from sample X101 in waste material.



DATE: 10/03/2018

TIME: 1320

PHOTO by: Tony Wasilewski

COMMENTS: Sample T103 was collected from sample X101 in waste material.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/03/2018

TIME: 1000

PHOTO by: Tony Wasilewski

COMMENTS: Sample S101 was collected from the surface water impoundment located on site. The water was covered with duckweed and was fairly clear with no odor or sheen.



DATE: 10/03/2018

TIME: 1000

PHOTO by: Tony Wasilewski

COMMENTS: Sample S101 was collected from the surface water impoundment located on site. The water was covered with duckweed and was fairly clear with no odor or sheen.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/02/2018

TIME: 1025

PHOTO by: Tony Wasilewski

COMMENTS: Sample X201 was collected from the intermittent stream from 0-4 inches. Consisted of silty clay.



DATE: 10/03/2018

TIME: 1000

PHOTO by: Tony Wasilewski

COMMENTS: Sample X201 was collected from the intermittent stream from 0-4 inches. Consisted of silty clay.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/02/2018

TIME: 1050

PHOTO by: Tony Wasilewski

COMMENTS: Sample X202 was collected from the pond located on the south side of the site from 2-6 inches. Fine sand with some silt.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/02/2018

TIME: 1505

PHOTO by: Tony Wasilewski

COMMENTS: Sample X203 & X204 were collected from the end of the ditch that enters a perennial waterway. was collected from the pond located on the south side of the site from 2-6 inches. Fine sand with some silt.



DATE: 10/02/2018

TIME: 1505

PHOTO by: Tony Wasilewski

COMMENTS: Sample X203 & X204 were collected from the end of the ditch that enters a perennial waterway. was collected from the pond located on the south side of the site from 2-6 inches. Fine sand with some silt.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/02/2018

TIME: 1550

PHOTO by: Tony Wasilewski

COMMENTS: Sample X205 was collected from the perennial waterway drainage ditch from 0-5 inches.



DATE: 10/02/2018

TIME: 1550

PHOTO by: Tony Wasilewski

COMMENTS: Sample X205 was collected from the perennial waterway drainage ditch from 0-5 inches.





DIGITAL PHOTOGRAPHS

Federal Lead Smelter-East Side
Alton, Illinois - Madison County

DATE: 10/02/2018

TIME: 1650

PHOTO by: Tony Wasilewski

COMMENTS: Sample X206 was collected from the pond located in Alton Park. Used as background sample.



DATE: 10/02/2018

TIME: 1650

PHOTO by: Tony Wasilewski

COMMENTS: Sample X206 was collected from the pond located in Alton Park. Used as background sample.



ATTACHMENTS

Target compound list

TARGET COMPOUND LIST

Volatile Target Compounds

Chloromethane	1,2-Dichloropropane
Bromomethane	cis-1,3-Dichloropropene
Vinyl Chloride	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride	1,1,2-Trichloroethane
Acetone	Benzene
Carbon Disulfide	trans-1,3-Dichloropropene
1,1-Dichloroethene	Bromoform
1,1-Dichloroethane	4-Methyl-2-pentanone
1,2-Dichloroethene (total)	2-Hexanone
Chloroform	Tetrachloroethene
1,2-Dichloroethane	1,1,2,2-Tetrachloroethane
2-Butanone	Toluene
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride	Ethylbenzene
Vinyl Acetate	Styrene
Bromodichloromethane	Xylenes (total)

Base/Neutral Target Compounds

Hexachloroethane	2,4-Dinitrotoluene
bis(2-Chloroethyl) Ether	Diethylphthalate
Benzyl Alcohol	N-Nitrosodiphenylamine
bis (2-Chloroisopropyl) Ether	Hexachlorobenzene
N-Nitroso-Di-n-Propylamine	Phenanthrene
Nitrobenzene	4-Bromophenyl-phenylether
Hexachlorobutadiene	Anthracene
2-Methylnaphthalene	Di-n-Butylphthalate

1,2,4-Trichlorobenzene	Fluoranthene
Isophorone	Pyrene
Naphthalene	Butylbenzylphthalate
4-Chloroaniline	bis(2-Ethylhexyl)Phthalate
bis(2-chloroethoxy)Methane	Chrysene
Hexachlorocyclopentadiene	Benzo(a)Anthracene
2-Chloronaphthalene	3-3'-Dichlorobenzidene
2-Nitroaniline	Di-n-Octyl Phthalate
Acenaphthylene	Benzo(b)Fluoranthene
3-Nitroaniline	Benzo(k)Fluoranthene
Acenaphthene	Benzo(a)Pyrene
Dibenzofuran	Ideno(1,2,3-cd)Pyrene
Dimethyl Phthalate	Dibenz(a,h)Anthracene
2,6-Dinitrotoluene	Benzo(g,h,i)Perylene
Fluorene	1,2-Dichlorobenzene
4-Nitroaniline	1,3-Dichlorobenzene
4-Chlorophenyl-phenylether	1,4-Dichlorobenzene

Acid Target Compounds

Benzoic Acid	2,4,6-Trichlorophenol
Phenol	2,4,5-Trichlorophenol
2-Chlorophenol	4-Chloro-3-methylphenol
2-Nitrophenol	2,4-Dinitrophenol
2-Methylphenol	2-Methyl-4,6-dinitrophenol
2,4-Dimethylphenol	Pentachlorophenol
4-Methylphenol	4-Nitrophenol
2,4-Dichlorophenol	

Pesticide/PCB Target Compounds

alpha-BHC	Endrin Ketone
beta-BHC	Endosulfan Sulfate
delta-BHC	Methoxychlor
gamma-BHC (Lindane)	alpha-Chlordane
Heptachlor	gamma-Chlordane
Aldrin	Toxaphene
Heptachlor epoxide	Aroclor-1016
Endosulfan I	Aroclor-1221
4,4'-DDE	Aroclor-1232
Dieldrin	Aroclor-1242
Endrin	Aroclor-1248
4,4'-DDD	Aroclor-1254
Endosulfan II	Aroclor-1260
4,4'-DDT	

Inorganic Target Compounds

Aluminum	Manganese
Antimony	Mercury
Arsenic	Nickel
Barium	Potassium
Beryllium	Selenium
Cadmium	Silver
Calcium	Sodium
Chromium	Thallium
Cobalt	Vanadium
Copper	Zinc
Iron	Cyanide
Lead	Sulfide
Magnesium	